ECHNOLOGY DEPT

THE PAPER INDUSTRY and PAPER WORLD

N EDUCATIONAL NEWS MAGAZINE—AUGUST, 1945

AUG 24 1945

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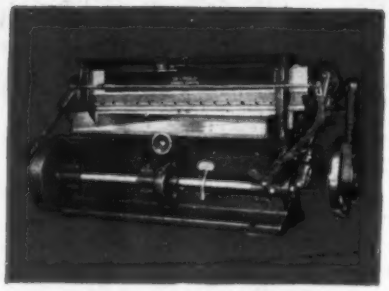

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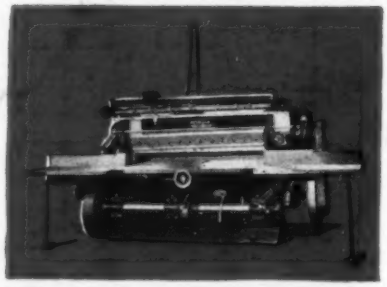
I'm a precision *machine*
Of massive design.
For accuracy—tops!
For speed—super fine!



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For making a series
Of accurate *cuts*
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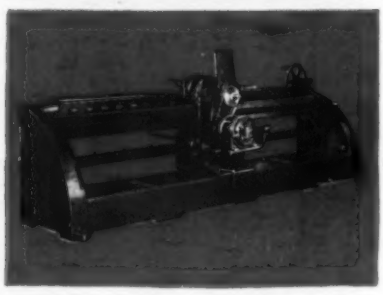
With plenty of guts!



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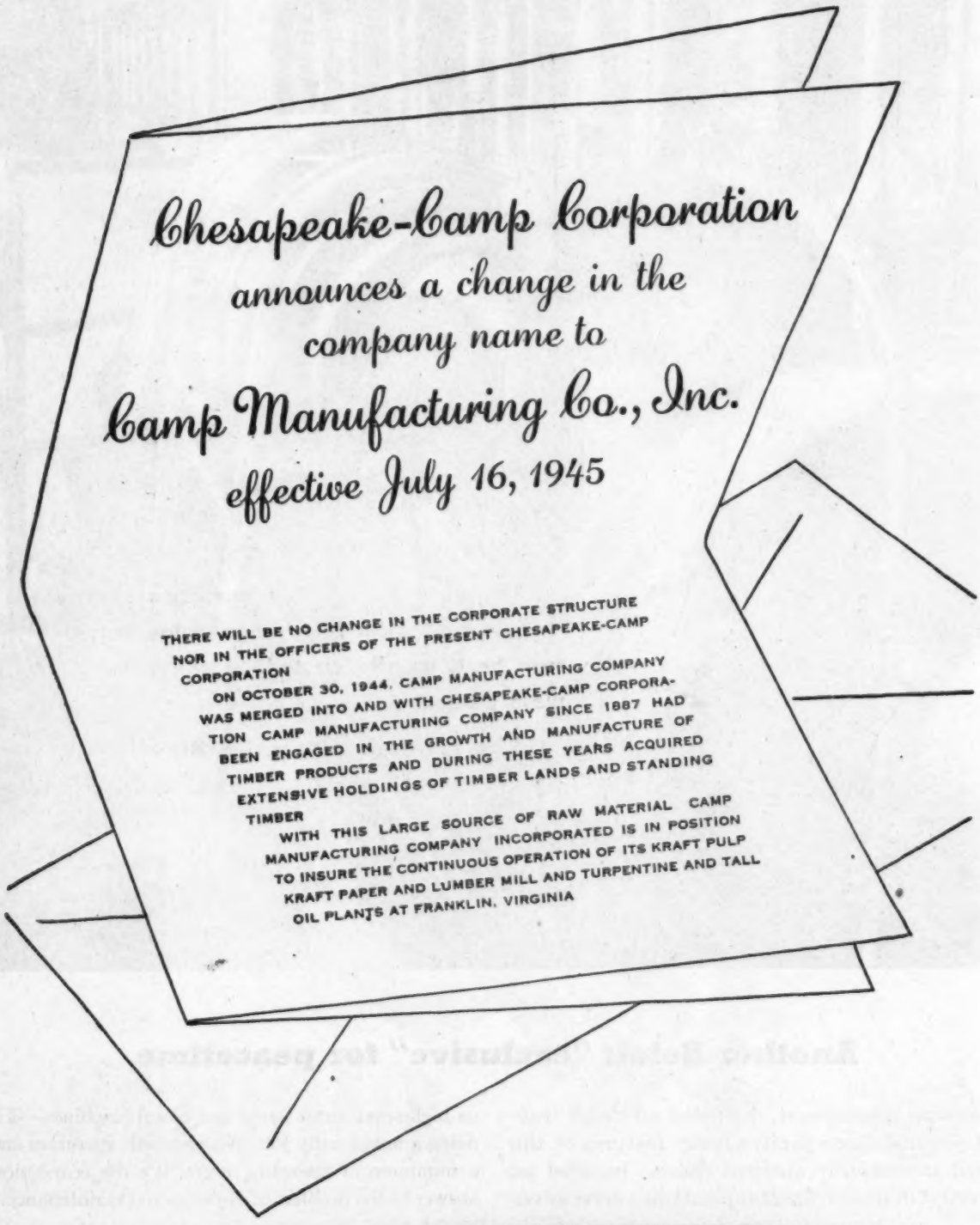
PAPER MACHINERY


Chesapeake-Camp Corporation
announces a change in the
company name to
Camp Manufacturing Co., Inc.
effective July 16, 1945
THERE WILL BE NO CHANGE IN THE CORPORATE STRUCTURE NOR IN THE OFFICERS OF THE PRESENT CHESAPEAKE-CAMP CORPORATION
ON OCTOBER 30, 1944, CAMP MANUFACTURING COMPANY WAS MERGED INTO AND WITH CHESAPEAKE-CAMP CORPORATION CAMP MANUFACTURING COMPANY SINCE 1887 HAD BEEN ENGAGED IN THE GROWTH AND MANUFACTURE OF TIMBER PRODUCTS AND DURING THESE YEARS ACQUIRED EXTENSIVE HOLDINGS OF TIMBER LANDS AND STANDING TIMBER
WITH THIS LARGE SOURCE OF RAW MATERIAL CAMP MANUFACTURING COMPANY INCORPORATED IS IN POSITION TO INSURE THE CONTINUOUS OPERATION OF ITS KRAFT PULP KRAFT PAPER AND LUMBER MILL AND TURPENTINE AND TALL OIL PLANTS AT FRANKLIN, VIRGINIA
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VOLUME 27 **AUGUST, 1945** **NUMBER 5**

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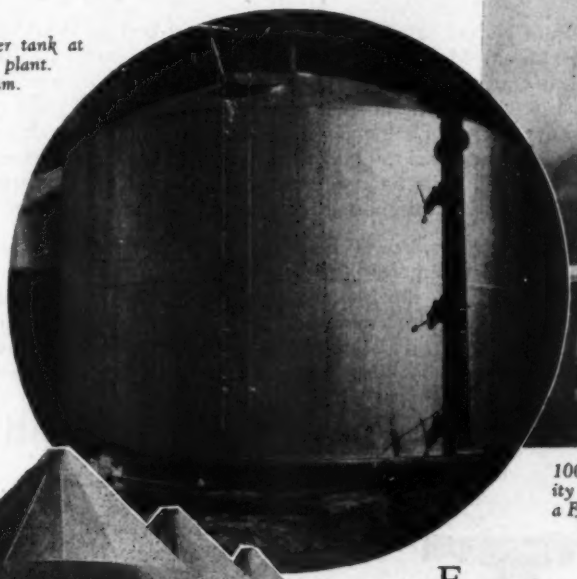
100,000 gal. elevated tank providing gravity water pressure for general service at a Florida mill.

Right: Fresh water tank at a pulp and paper plant. It is 25 ft. in diam. and 15 ft. high.



Below: Three 30 ft. diam. by 50 ft. 6 in. salt cake storage bins. They hold 833 tons each.

Every wise pulp and paper mill operator knows that profitable, efficient and quality production depends to a great measure on the facilities he has to do the job. Here are several examples of tanks and steel plate work for the pulp and paper industry. They were designed and fabricated to meet specific mill requirements and perform specific pulp and paper industry service.

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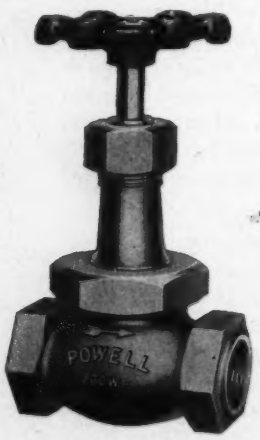

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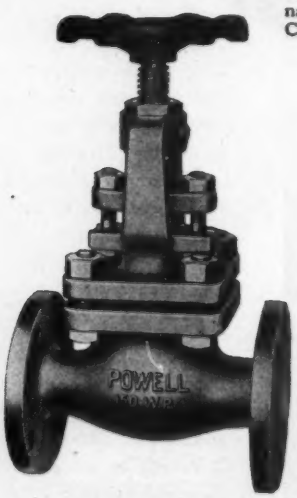
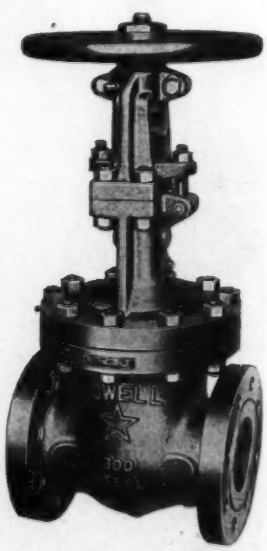


150-pound O. S. & Y. Gate Valve. Available in All Pure Nickel, All Monel Metal or All Inconel.

200-pound Gate Valve. Available in All Pure Nickel, All Monel Metal or All Inconel.



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MIDWEST places a resident engineer with a permanent staff of supervising erectors on the job. All Midwest qualification welders are from our own shop organizations. Midwest carefully controls the flow of materials from drawing board to the complete installation.

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MIDWEST has done more than that . . . among Midwest developments are the Gleback joint which greatly improved lapped joints, the Midwest saddle for better reinforcing branch outlets, and a complete line of pipe welding fittings. Midwest piping research is continuous.

"Can he be of any special help on my job?"

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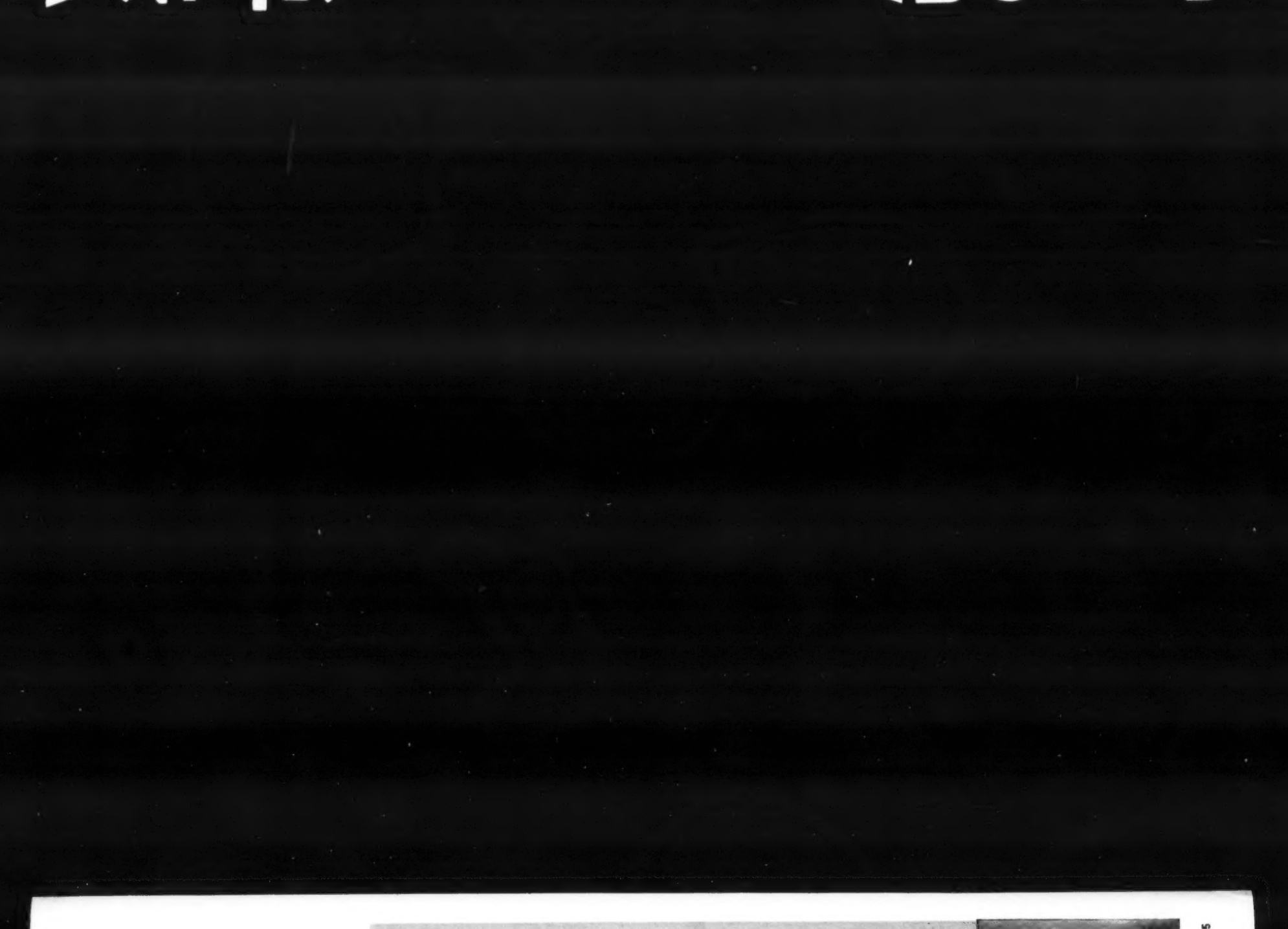
PIPING FABRICATORS AND CONTRACTORS



F
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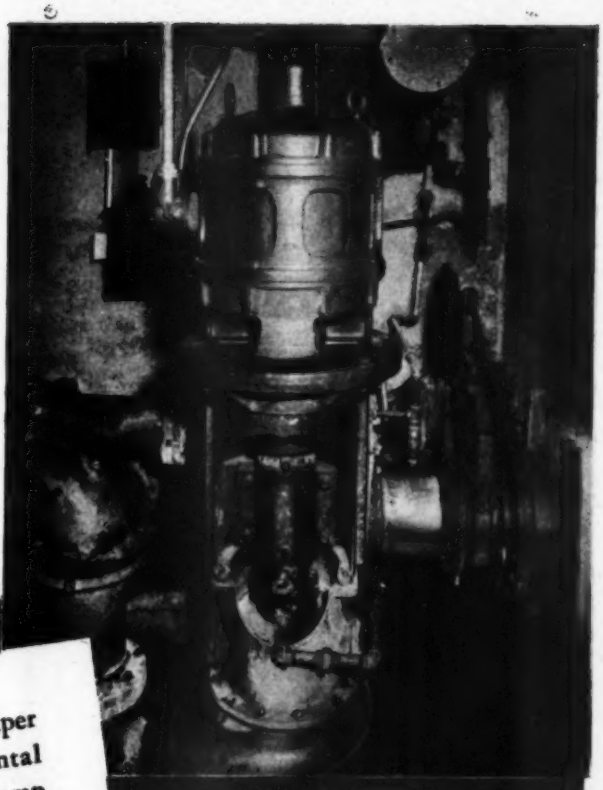
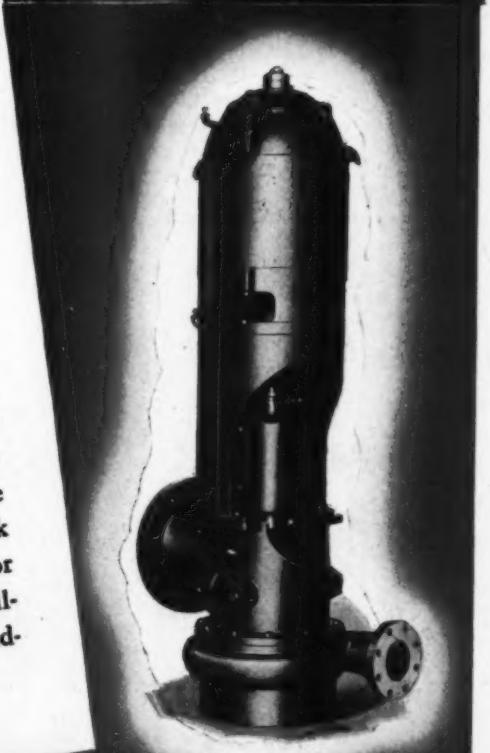
Vertical
STOCK PUMPS

For Blow Pit . . . Bull Screen . . . Brown Stock . . . High Consistency Deckered Stock . . . Heavy Bleached Stock . . . Broke . . . Machine Feed . . . Couch Pit, etc.





Ingersoll-Rand vertical pumps for handling paper stock have definite advantages over horizontal pumps for certain installations. The entire pump may be submerged below the bottom of the stock chest. In designing new mills, this permits lowering the stock chest. In existing mills it often solves troublesome problems caused by lack of head on the pump. In addition very little foundation is required and the motor is well above the floor and possible flooding.

Other features which contribute to long life, high efficiency, and easy maintenance are: liberal suction areas, impeller is easily adjusted to compensate for wear, renewable shroud, impeller and bearings are interchangeable with I-R horizontal stock pumps.

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What Might Have Been
important papers for the coming generations, became only wood ashes where proudly grew a priceless forest (see page 672).
Press Association, Inc.

1945

Trade Winds

Postwar Expansion and Modernization

Crown Zellerbach—
$15,000,000 Program

▶▶▶ Fifteen million dollars will be spent by Crown Zellerbach Corporation in its pulp and paper plants on an extensive plan to improve its plants and processes during the next several years as wartime restrictions are slackened sufficiently to release necessary materials according to the 1945 annual report just released. Major portion of this amount will be spent in the Pacific Northwest, where the corporation operates five pulp and paper mills and extensive forest properties, and will be in addition to normal expenditures for betterment of plant facilities and upgrading of products.

Long-term contracts have been signed with Time, Incorporated, and another large eastern publishing firm for furnishing from 45,000 to 60,000 tons of coated magazine paper annually. This will require important changes to the paper mill at West Linn, Oregon, where the coated paper will be produced. This new departure from traditional Crown Zellerbach manufacture will see coating clay used in liberal quantities, which will result in a substantial reduction in pulpwood usage and therefore be an aid in forest conservation. This pioneer Oregon plant began making newsprint for San Francisco newspapers from cottonwood in 1889, and since has utilized hemlock, spruce, and white fir. In order to meet the magazine contracts, one existing newsprint machine will be completely rebuilt and another replaced, and necessary auxiliary equipment, buildings and facilities will be added.

The sulphate mill at Camas, Washington, will be increased to nearly double the present capacity and a modern sulphate bleaching plant installed, marking the first bleached sulphate pulp equipment to be installed in any of the corporation's plants. The bleached pulp produced in this new unit will be used to improve the quality of papers produced at Camas and to supply a new paper machine of the most modern design to permit production of some additional grades of top quality specialty papers. A new paper machine also will be installed at Camas to produce facial tissues. The Camas plant was the first paper mill to operate in Washington territory, being built in 1883 to supply newsprint for Portland newspapers.

A construction program is already under way at the Port Townsend, Washington, kraft mill, where a complete new kraft chemical recovery unit was authorized some months ago by the War Production Board. It is in the Townsend mill that the first hydraulic log barker was developed and installed by Crown Zellerbach. A new drum barker will also be installed there so the mill may take delivery of cordwood cut in the farming communities and other woodlots adjacent to Port Townsend.

Postwar plans call for installation of a modern hydraulic log barker in the newsprint mill at Port Angeles, Washington, and resumption of operations of No. 1 newsprint machine, which has been down since September, 1942, for lack of logs and manpower. Installation of the hydraulic barkers is also a step forward in forest conservation, as they make possible 10 to 15 per cent fuller wood usage than was possible under previous barking methods.

Corporation officials said recently that detailed engineering is about completed on the West Linn project, and that it should not be long before bids can be called on those units for which materials are available. They also said that the corporation program anticipates absorbing all regular employees now in military service and should ultimately result in hiring additional workers.

Gearing its forest growth to the long-range manufacturing program, Crown Zellerbach recently made new acquisitions to its Pacific Northwest timberlands, bringing total ownership now under scientific forest management to about 400,000 acres. It is estimated that these lands will produce new growth annually approximately equal to the pulpwood needs of the five Washington and Oregon plants. When manpower is available, the present forest management program will be amplified by conversion of old logging railroad grades into truck roads. These will provide access for tree plantings, transport of fire fighting equipment, systematic thinnings and a more complete recovery of non-commercial timber of smaller sizes formerly left in the woods.

With Government revising its list of critical materials, and with larger amounts of supplies becoming available, the paper industry prepares for a new day—one that has been anticipated almost since the world conflict got under way. . . . From several large companies come announcements of postwar building plans.

Subject to ratification by stockholders at their annual meeting on August 9, 1945, the Crown Zellerbach retirement plan will become effective September 1, 1945. The plan provides a retirement program for veteran workers, who, after 65, will receive specific monthly benefits in accordance with their wages and length of service. All retirement benefits based on past service will be financed solely at expense of the company, which will ultimately contribute more than $4,000,000 into a trust fund for this purpose. Benefits based on future service will be financed jointly by the company and participating employees, the company contributing about two dollars for each dollar placed in the trust fund by employees.

West Linn Program

Following is the program outlined for West Linn:

Groundwood Mill—Installation of six large electric motors to furnish power during low water periods in order to eliminate necessity for seasonal operation during high water periods which has been traditional at West Linn since it began operation 57 years ago. There is a fairly large working force in the wood mill and the groundwood mill, which have operated between six and seven months a year. After installation of the motors, the crews will work steadily throughout the year. Separate stock systems will be installed in the groundwood mill—one to furnish stock for coated book paper and the other for newsprint.

Paper Machines—Present newsprint machines Nos. 5 and 6 will be taken out of newsprint manufacture. Number 5 will be completely rebuilt into a modern, high-speed paper machine to produce coated paper in reels 140 inches wide. Number 6 will be replaced by a new, high speed modern paper machine to produce coated paper in reels 155 inches wide. Each machine will have a complete coating section added and will be capable of producing machine coated book papers of high quality and at high speed, in a continuous process.

Chemical Pulp Mill—Crown Zellerbach's postwar plans provide for abandonment of the sulphite pulp mill at West Linn and the building of a new pulp mill using the alkaline pulping process. However, the rebuilding by the U. S. Government of the locks at West Linn which run the entire length of the mill properties on the West side of the Willamette River necessitates the deferring of the construction of this soda mill, together with additional water filtration plant and an additional boiler installation, until the completion of this project by the Government.

Pulp Bleaching Plant—In order to serve the two coated book paper machines, a pulp bleaching plant of 75 tons daily capacity will be installed in a modern concrete building. This will later become a part of a bleaching plant to serve the future alkaline pulp mill.

Finishing Room—The present wooden structure will be completely rebuilt into a large, modern three-story concrete building to house the Finishing Room. Installations in the Finishing Room will include a battery of three 14-roll supercalender stacks 155 inches wide in addition to news finishing equipment to serve No. 9 newsprint machine. Coated book paper reels will be brought into the Finishing Room and run through the supercalenders in order to get the required finish and gloss for reproducing good photography and top quality printing, so essential in up-to-date magazines.

Clay Storage—As great quantities of clay coating are to be used in the manufacture of coated magazine paper at West Linn, the clay storage and mixing equipment will require a large three-story, modern concrete building. In this building the clay with other chemicals will be mixed to a semi-fluid consistency, and pumped from the clay mixing room to the coating section of the paper machines. Principal sources of coating clays are from deposits in Georgia and England.

Manufacture of machine coated paper at West Linn is a historical departure for Crown Zellerbach Corporation, and will be the first time this grade will have been manufactured in large quantities on the Pacific Coast.

The use of coating on both sides of the book paper not only produces a superior printing paper, but has the added advantage that the clay actually displaces a substantial quantity of wood pulp per ton of paper, thereby making an additional contribution to forest conservation.

Locker Rooms—A central locker room and dressing room will be built and equipped with modern showers and washroom facilities and with individual lockers to accommodate 750 workers.

Camas Program

Wood Mill—One of the largest projects in the Camas building program will be major changes and installations in the wood mill. These changes and modernizations actually fit into the Crown Zellerbach forestry program since they will make possible the use of smaller wood, new species, non-commercial sawlogs and second growth and cordwood from nearby farm woodlots. A modern hydraulic barker will make possible additional wood savings in excess of ten per cent. A new chip storage will be built and new chippers installed.

New Kraft Mill—An addition to the present kraft mill will accommodate a complete new kraft mill unit which will increase the total kraft mill capacity at Camas to about 350 tons every twenty-four hours and make possible a two-system kraft mill to manufacture two or more kinds of kraft pulp from different wood species. Installations in the new kraft mill will include five new rotating digesters, a new pulp washing room, a new lime kiln, high density stock storage chests and a complete new furnace and recovery system with Cottrell precipitator.

Kraft Screening Building—Added to the present sulphite bleach plant building, a new modern concrete addition will be built to accommodate the kraft screening operation necessary to the expanded production.

Kraft Bleach Plant—A large modern concrete building will be built to house a seven-stage bleach plant which will embrace all features of the most modern kraft bleach plants in the pulp-producing world.

Boiler Room—A new high pressure, oil-fired boiler plant with a capacity of 135,000 pounds of steam per hour will be constructed. This will be the first of two such units to be ultimately installed at Camas.

Facial Tissue Machine—As previously announced, a new facial tissue machine has been ordered and is already being built to be installed in the present machine room. This machine will be utilized to manufacture facial tissue and facial grade toilet tissue. Additional equipment will be installed to convert products from the new machine.

New Machine Room and Finishing Room—A large, new, modern, concrete paper machine and finishing room building will be built, into which will be installed Number 15, a new modern fourdrinier paper machine to make high quality grades of specialty papers. This machine will embody all the features of the most modern papermaking machine.

M and O Plans—$6,000,000

▶▶▶ Complete plans for the modernization and expansion of Minnesota and Ontario Paper Company, Minneapolis, were announced on July 11.

PAPER · · · America's 6th Industry

PAPER "BOMBS" FOR PROPAGANDA

(NEWS ITEM: *80,000 propaganda leaflets can be contained in each standard 300-lb paper bomb.*)

Paper "bombs" containing surrender passes and propaganda literature are dropped on enemy targets by American Bombers. These cardboard cylindrical containers are the fibre cases in which medium-size bombs are shipped overseas. Designed for release from high altitudes, these "bombs" can be set to discharge at a predetermined altitude assuring accurate delivery of the pamphlets.

Gas-mask canisters made of paper . . . Paperboard containers used for blood plasma . . . Tropical helmets of laminated fiber . . . Paper barrels for rocket guns . . . New uses for paper, calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

Puseyjones men and production facilities are still at War—and Industry at War is Industry thinking and working at hitherto unheard of speeds. Our Research and Development Committee, working on the problems of America at War, have found many practical and technical advantages that will be of incalculable value to America at peace—to the Paper-Making Machinery of the future.

The modernization of existing Paper-Making Machinery and the construction of new machinery is now possible without approval of the War Production Board, and is dependent only on the availability of necessary materials.

Our engineers are on call for a survey of your requirements.

The new Puseyjones Paper Production CALCULATOR is yours for the asking. A time saver for superintendents, engineers, executives or other interested members of your organization.

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery

Wilmington 99, Delaware, U. S. A.

THE SIGN OF WAR SUPERIOR QUALITY

This plan, involving expenditures to exceed $6,000,000, was made possible by the financial readjustments approved by the stockholders at their annual meeting on May 28, this year.

Donald D. Davis, president of Mando states the contemplated facilities program for the production of new products and improvement in present products will go forward as rapidly as equipment, material and labor will permit.

Government approval has been obtained on all of the major projects which include:

International Falls (Minn.)

New Insulite manufacturing machine, increasing capacity 40 per cent

New research laboratory

Additional equipment for grinding wood and manufacturing paper

New plant for bleaching 100 tons of kraft paper daily

New plant for bleaching 75 tons of groundwood daily

New plant for filtration of the huge quantities of water used in making paper

Mechanical equipment to insure maximum utilization of by-products

Additional structures for housing Mando employees

Additional machines for preparing and grinding pulpwood and manufacturing papers

Extensive modernization of miscellaneous equipment and installation of new machinery

Fort Frances and Kenora (Canada)

New facilities for production of groundwood

New water wheels and other additions to hydroelectric and steam power plants

Modernization of paper machines

Extensive new miscellaneous plant equipment

New tug and work boats and other marine equipment

Modernization of wood grinding equipment and installation of new machinery

New woods operating facilities and equipment in both Canada and the United States include new headquarters camps and logging camps with improved living facilities, refrigeration, electric lights and two-way radio communications, and major additions to the expansion of mechanized logging equipment.

Mr. Davis further stated that the facilities program of modernization and expansion when accomplished, and at the estimated rate of operations, would require a total of approximately 5,600 company employees at all plants and in the woods, compared with present employment of approximately 4,180, which include 900 prisoners of war now working in the Canadian woods. It is, therefore, estimated that the modernization and expansion program at all plants and in the woods will provide approximately 2,300 new civilian jobs. There are 1,251 men and women in the Armed Services of the United States and Canada, the majority of whom are expected to return to the Company.

The directors of the Mando properties in approving this comprehensive modernization and expansion program were very much encouraged by the enactments of the last session of the Minnesota Legislature, which, while not completely sufficient, provided additional help to the State Division of Forestry showing that the legislators had an increasing realization of the importance of Minnesota forest industries. Mr. Davis further stated that it is expected this program can be completed in three years or less. Present rates of production continue to be limited by shortage of woods labor in both Minnesota and Canada, but it is hoped that these conditions will gradually improve.

Nekoosa-Edwards Expansion—$500,000

▶▶▶ Work will begin immediately on a $500,000 expansion program at the plant of Nekoosa-Edwards Paper Company, Nekoosa, Wisconsin. Formal approval authorizing the project has been given by the War Production Board. The plan includes a new bleach plant and water filtration plant at Nekoosa.

John E. Alexander, president and general manager of the company, has outlined a two-fold purpose of the expansion:

1) By means of an improved process of bleaching kraft pulp, the resultant pulp will be of a far superior quality, both as to strength and brightness.

2) The new unit will more than double the volume of bleached kraft pulp now being produced in the Nekoosa mill.

In its chemical pulp mill located at Nekoosa, the company products kraft pulp only. The capacity of this mill in 24 hours is 150 to 160 tons, dependent upon the type of pulpwood used. At the present time, about 35 to 40 tons per day of this pulp are manufactured in the full bleach grade, 55 to 60 tons in semi-bleached, and the balance in the unbleached grade.

The general contractor for this project will be Frank J. Henry Engineering Company, of Wisconsin Rapids. The new bleaching system will be furnished by the Improved Paper Machinery Corp., Nashua, New Hampshire, and will be a 6-stage process.

Because practically colorless water must be used in the bleaching process, the filtration plant is being constructed in conjunction with the bleach plant.

The filter plant will be of the gravity type construction, as manufactured by Infilco, Incorporated, Chicago. The plant will have a filtration capacity of 3,600 gpm with ample provision made in the way of construction, equipment and piping so that the plant may be extended at a future date, if needed, to a capacity of 8,400 gpm.

The water to be used will be taken from the company's main line now supplying the Nekoosa mill with water, the source of which is Nepco lake. When the water is delivered to the filter plant, it will be treated with a small amount of chemical, and after passing through a coagulator, will be delivered to the filter beds where it is filtered through a suitable filtering medium and delivered to a clear well directly underneath the filter bed. From this well the water will be pumped to the bleach plant for use in the improved process of bleaching kraft pulp.

The increased tonnage of full bleached kraft pulp will be used in both the Nekoosa and Fort Edwards paper mills. With this additional tonnage of full bleach kraft pulp made available, it will enable the company to expand its production of kraft specialties and specification papers, as well as to continue producing its present grades.

Mr. Alexander states that the company desires to get the new units into production as quickly as possible. He further stated the company wishes to employ just as much local labor as is available. All the equipment, supplies and materials will be purchased through the company's purchasing department. Company supervision will be handled by Nepco's engineering department.

Approval Given Sorg Co. For Power Plant Addition

▶▶▶ An announcement just received from The Sorg Paper Company, Middletown, Ohio, states that it has received approval from the WPB to cover an addition to its power plant which will house a new boiler and accessory equipment. The following brief outline of the equipment involved is given:

The power plant expansion will consist of a building extension to house a new 120,000 lb. per hour, 425 lb. pressure boiler and a new feed water treating system.

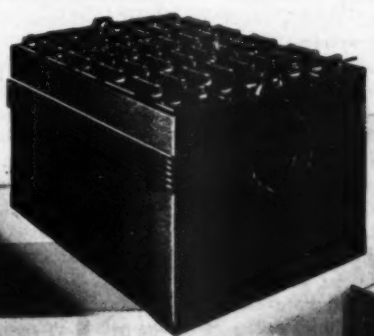
PHILCO

gives you the latest in Modern Battery Design!

THOUSANDS of electric industrial trucks are now getting more work done at lower cost because of the advanced research of Philco engineers in developing tougher, more powerful storage batteries. Philco has long led in providing batteries of maximum capacity, with the rugged long-life construction especially engineered for today's heavier work schedules.

Now Philco engineering leadership is demonstrated anew with the storage battery that gives 30% longer life —the great new Philco "Thirty"! For lower cost in handling materials with electric trucks, be sure to include the new Philco "Thirty" in your plans. Now available in preferred types. Complete information gladly sent on request. PHILCO CORPORATION, *Storage Battery Division,* Trenton 7, New Jersey.

For 50 years a leader in Industrial Storage Battery Development



The new Philco "Thirty" with 30% longer life is identified by its distinctive red connectors.

The boiler will be fired with powdered coal furnished by two pulverizers supplying fuel to four burners. Automatic combustion control will be used.

The feed water treating plant will be a two-stage system with hot process lime and soda in the first stage, followed by a phosphate stage.

A new 250-ton coal handling and storage system also will be installed. This will consist of conventional storage silo with automatic delivery and weighing of coal to both new and old boilers.

Contracts for nearly all of the equipment have been placed. J. E. Sirrine and Company, Greenville, South Carolina is consulting engineer, working with G. H. Suhs, Sorg company's chief power engineer.

It is stated that the increase in production on all of the company's paper machines during the past several years has called for additional steam and power to such an extent that existing boilers were inadequate in capacity. The new 120,000 lb. unit and the present three 50,000 lb. units not only will provide adequate steam and power for maximum loads, but also reserve capacity that will make possible, at all times, proper maintenance of boiler and accessory equipment.

Union Bag Expansion Will Cost $2,000,000

▶▶▶ Design and construction of a pulp washing plant and power facilities for Union Bag and Paper Corporation, to provide for expansion of its Savannah, Georgia, plant from 800 to 1,000 tons per day, is now under construction by The Rust Engineering Company, Pittsburgh, Pennsylvania.

The work, estimated to cost in excess of $2,000,000, includes erection of brick and steel pulp washing building with machinery and equipment, boiler house incorporating a 200,000 pound-per-hour steam boiler, coal bunkers and handling system; complete water treating plant; river water intake and pump house; new 7,500 K.W. turbo generator; and auxiliary equipment.

The Savannah mill is a producer of paper and board, multi-walled bags, retail store and specialty bags. The new additions, scheduled for completion this year, will relieve equipment which has been operating at peak war loads as well as provide a more than 25 per cent production increase.

Two lines of washers in the new pulp washing plant will have a potential capacity for 400 tons of finished product per day, while also supplementing the existing diffusers for washing pulp. The design of the high density storage tanks, permitting storage of a greater reserve supply, is a notable feature in the washer plant equipment.

The new boiler will be the ninth, and largest, fuel fired power boiler at the works. Water treating equipment and boiler feed pumps are incorporated besides coal handling facilities in the boiler house. One existing boiler is being converted to burning bark.

The water treating plant will treat all water for both power and recovery boilers. A new substation and pump room also have been provided. The river water intake and pump housee will be constructed to provide circulating water to a condenser for the new 7500 kw. turbine which will be installed to replace an old unit, which was purchased second-hand and installed as a war measure during the period of critical priorities.

Champion Announces $1,000,000 Expansion

As this issue closes, a press release states that The Champion Paper and Fibre Company, Hamilton, Ohio, announces a $1,000,000 expansion program. Improvements will be made in plants at Canton, North Carolina, and Houston, Texas.

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▶▶▶ EXTENSIVE ADDITIONS and alterations have been made to the mill formerly operated by the Algonquin Paper Company, Ogdenburg, New York. This plant was purchased in October, 1944, by Berst, Forster & Dixfield (of P. I. and P. W. Nov., 1944, p. 968). An order has been placed for a new 134-inch fourdrinier paper machine, for delivery as soon as possible.

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FINANCIAL

Securities markets have remained at a high level since the middle of June, and the Securities and Exchange Commission has taken various steps to prevent undue speculation. Many market traders have hedged against inflation by securities purchased, keeping stock and bonds prices at high levels.

Brown Company—Net income for twenty-eight weeks ending June 17 was $821,263 as compared with $778,792 for the corresponding period in 1944.

Champion Paper and Fibre Company—Net income for the fiscal year ending April 29 was $1,803,864, as against $1,970,526 for the previous fiscal years.

Masonite Corporation—Net profit for three months ending May 31 was $321,184, as against $304,918 for the corresponding quarter in the previous fiscal year. Cumulative profits for nine months were $933,764 as against $814,637 for the same period in the previous year.

Sorg Paper Company—Net income for 1944 was $135,956 as against $294,206 in the preceding years.

New York Stock Exchange—Stocks

	Closing Prices July 20	June 25
A.P.W. Products ..	5⅞	7
Celotex	16⅛	17⅜
Same Preferred..	21	*20¾-21¼
Certain-Teed Prod.	10	11
Same Preferred..	159	160
Champion P&F Co.	32½	37
Same Preferred..	*110¾-111	110⅛
Container Corp....	29	29
Cont. Diamond....	12½	13½
Crown Zellerbach..	22	23¾
Same Preferred..	103	104½
Dixie Vortex	*26⅞-27⅛	29
Same "A"	48¼	48½
Robert Gair	6¼	7¼
Same Preferred..	17⅞	18⅜
Gaylord Cont'r..	*25½-26¼	*28¼-28½
Same Preferred..	*59-61	60
International Paper	25⅜	28
Same Preferred..	97½	98½
Kimberly-Clark ...	45¼	48-48½
McAndrews & Forbes	33⅛	33
Masonite	42⅜	44½
Mead Corp.....	15⅛	15⅛
Same Preferred..	*104-105	*103½-104
National Container.	15¼	15⅜
Paraffine Cos	65½	*67-70
Same Preferred..	100	108
Rayonier, Inc.	19⅛	21¾
Same Preferred..	36	36¾
Scott Paper	51½	49
Same 4½% Pref.	*108-112	*112-113½
Same 4% Pref..	112½	112
Sutherland Paper..	*34-34¾	33½
Union Bag & Paper	16⅞	18
U. S. Gypsum....	89	92⅝-94
Same Pref....	*190¼-191⅞	*190-193
West Va. P&P Co.	28½	31
Same preferred..	*111-113	110

New York Stock Exchange—Bonds

Abitibi 5%.....	110½	103
Celotex 3¾%	...	...
Certain-Teed 5½%	...	...
Champion P&F Co.	...	...
Intl. Paper 5%....	104⅛	...
Same 6%	108⅓	...

New York Curb Exchange—Stocks

Am. Writing	8½	9⅞
Great Northern ...	39½	41¾
Hummel-Ross	9	9¼
Pug. Sound	16½	17⅞
St. Regis	6⅞	7½
Taggart	...	6¾
United Wall Paper.	5½	5⅛

*Closing Bid and Asked Prices.

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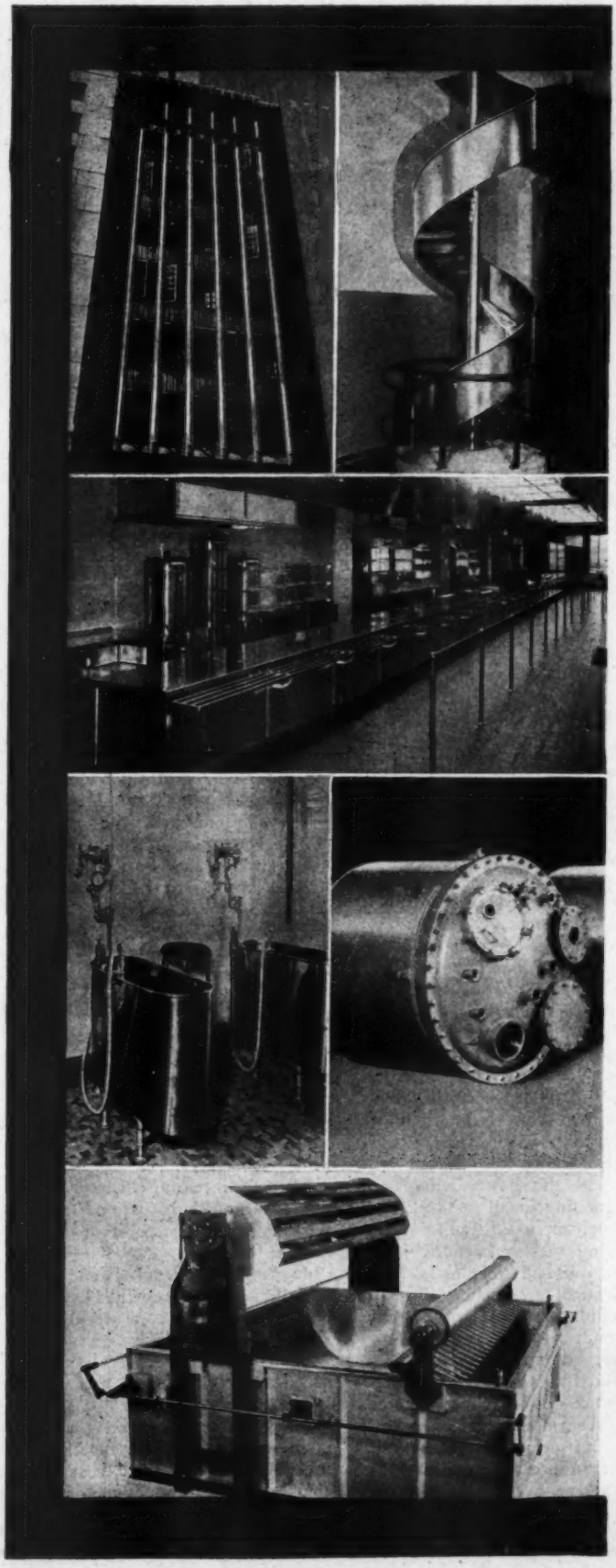
▶▶▶ ARMY AUTHORITIES have announced that prisoners of war now engaged in pulpwood cutting in the northeastern area will probably be held for such work through the balance of this year. Present improved conditions in the South are largely attributed to the ability to get out pulpwood through the use of war prisoners.



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JMLCo. B-III

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CONTROL OVER CONVERTERS HAS BEEN RELAXED BY WPB

Converters who consumed less than five tons of pulp, paper, or paperboard per quarter in 1942, or none of these substances in the same period, may now use five tons per quarter in the manufacture of any converted paper products under amendment to the order M-241-a, issued July 14.

The quarterly paper quota of converters manufacturing unlisted products was increased from 65 to 80 per cent of the tonnage similarly consumed in a corresponding quarter in the base period 1942, although the tonnage of pulp and paperboard is still limited to the 65 per cent level as heretofore. M-241-a still limits the manufacture of listed restricted products to percentages running from 80 to 110 per cent of 1942 production.

NEW ORDER WILL CURB IMPORTS OF NEWSPRINT FROM NORTHERN EUROPE

An announcement from the War Production Board, dated August 3, stated that effective on that date all imports of standard newsprint paper will come under WPB control.

An amendment to the General Imports Order, M-63 (of that date) implemented a recommendation of the Combined Raw Materials Board that the supply of newsprint from Scandinavia be used to meet at least a part of the requirements of the liberated areas of Europe. This recommendation was made to effect an equitable distribution of the world's supply of newsprint for the purpose of satisfying essential requirements until the end of the war. Standard newsprint paper is in short supply, and European requirements will have to be met from North America unless the liberated areas obtain imports from Scandinavia, according to the CRMB.

This position also was taken by the Newspaper Industry Advisory Committee at its meeting last month. At that time, the newspaper committee recommended that newsprint requirements of liberated European areas be supplied by Scandinavian rather than North American mills. It was emphasized by the Committee that the adoption of this recommendation would save shipping space by eliminating two-way traffic of newsprint across the Atlantic, would permit liberated areas to obtain newsprint quickly from their nearest source of supply, would stabilize delivery schedules from North American mills, and would augment the United States newsprint supply by reducing or canceling some European requirements for North American supplies.

▶▶▶ BRIGHTNESS LIMITATIONS of various grades of paper and paperboard, attained by the use of chlorine, were removed on July 4, by revocation of Order L-11, which was issued April 30, 1943. A similar move was effected by the Canadian pulp and paper industry on July 1. WPB wishes to emphasize, however, that chlorine, used as a bleaching agent in papermaking, will continue to be allocated under Conservation Order M-19.

FIRST PULP FROM OVERSEAS FOR PAPER MANUFACTURE

The first importation of overseas wood pulp for paper manufacture since the war in Europe cut off exports from Northern European countries arrived in the United States during the week ended July 20th, according to the Pulp and Paper Unit, Department of Commerce. (*The very first shipment of pulp from overseas reached the United States during the week ended June 29. However, that first shipment was composed of rayon pulp and sample shipments.*

Two vessels arrived from Sweden, one at New York and one at Boston with cargoes of 4,648 short tons and 4,816 short tons respectively, totaling 9,464 short tons. The value of the New York entry was placed at $336,288, and the Boston entry at $352,624, totaling in all $688,912.

The entries of wood pulp which arrived during the week ended June 29, have been revised as follows: these entries now total 2,230 short tons of bleached sulphito, rayon and special chemical grades, valued at $179,830, plus sample shipments of 20,915 pounds, valued at $1,247.

As a service to the United States pulp and paper industry the Department plans to issue a release each week for the next three or four months covering imports of overseas wood pulp by grades and customs district of entry.

Entries of Wood Pulp into the United States from Europe by customs districts and country or origin, week ended July 20, 1945:

District, country, and grade	Quantity Short tons	Value
Into New York District:		
From Sweden—		
Sulphite, unbleached	1,120	$ 82,800
Sulphate, unbleached (Kraft pulp)	3,528	$253,488
Total	4,648	$336,288
Into Boston District:		
From Sweden—		
Sulphite, unbleached	1,120	$ 82,800
Sulphate, unbleached (Kraft pulp)	3,696	$269,824
Total	4,816	$352,624
Grand Total	9,464	$688,912

Source: Data supplied by the Bureau of the Census.

▶▶▶ THE BOOK PAPER Manufacturers Association and forty-two member manufacturers have been ordered by the Federal Trade Commission to discontinue fixing uniform prices. The order was issued after several years of hearings and arguments before the Commission. The Federal Trade Commission finds the principal fault to be in existing trade customs and zoning practices.

▶▶▶ THE OFFICE OF Price Administration has authorized increases in the ceiling of four major grades of groundwood printing papers as follows: No. 2 Hanging, 20 cents per hundredweight; No. 1 Railroad Manila and No. 2 Railroad Manila, formerly priced at $4.75 and $4.25, to be consolidated into one grade at $4.75. No. 1 Groundwood Poster and No. 2 Groundwood Poster, previously priced at $4.75 and $4.25 to be consolidated into one grade at $4.85.

SIGNS OF THE TIMES POINT TO A SOMEWHAT EASIER PAPER SITUATION

Despite Washington pessimism and caution as to the continuance of a paper shortage, there are definite indications that since the end of the war in Europe the stringency is definitely on the way toward an end, and that while shortages will continue for many months, there will be a progressive easing of the situation. Some of the developments pointing to this change follow:

1. Pulp shipments from Scandinavia have begun, and the Department of Commerce will issue weekly statistics of imports.

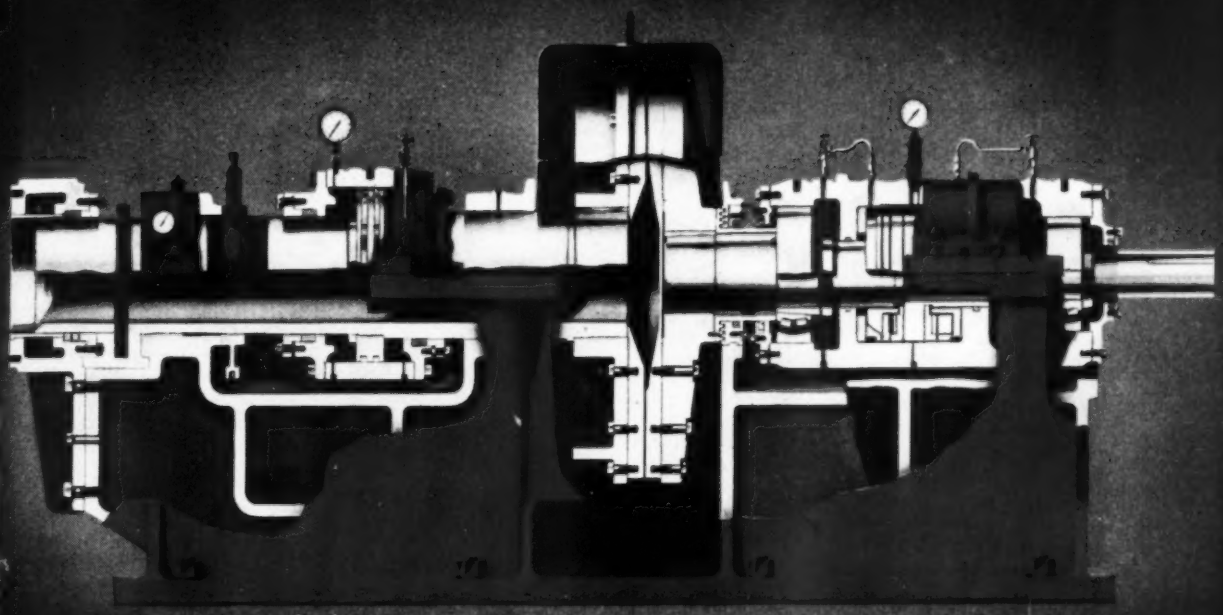
2. There have already been orders issued easing controls on various paper grades, chiefly printing.

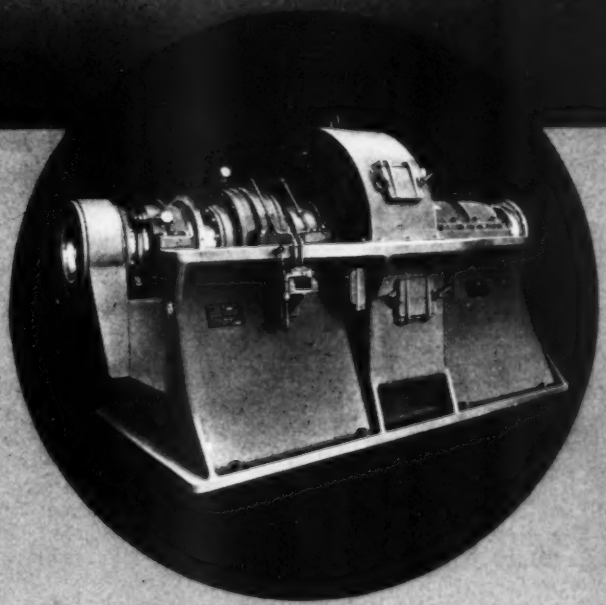
3. The restrictions on the use of chlorine have not been modified, but mills have been notified that restrictions on the production of bright papers have been removed.

4. Newspapers are to be allowed

SUTHERLAND

continuous BEATING AND REFINING SYSTEM





During the two years of war emergency, when all metals were critical, every one of the 70 Sutherlands in the United States kept running without shutdown for repair parts; proof of quality in design and precision construction.

SUTHERLAND REFINER CORPORATION

TRENTON, NEW JERSEY

a slight increase in their use of newsprint paper.

5. Pulpwood production is on a more favorable scale.

6. Changed conditions in Europe will result in steps to supply Europe's needs for paper to a larger extent from Scandinavia, thus relieving North America of the need for helping proportionate quantities of paper for continental use.

While these developments are straws in the wind, there should not be too great optimism for the future. Conditions will undoubtedly remain tight at least through this year, and possibly for longer, for there is undoubtedly a back log of business which will result in increased orders as soon as the mills are more able to accept offers.

▶▶▶ THE SMALL ORDER exemption for casein was raised from 6,000 to 30,000 pounds per quarter on July 6. Formerly controlled by Order M-307 (revoked on July 6), casein is now governed by Schedule 113 to Order M-300, the general chemical allocation order. The shift to M-300 was made in line with the WPB policy of bringing as many allocated chemicals as possible under the control of a single order.

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CHESAPEAKE-CAMP CORP. NAME CHANGED TO CAMP MANUFACTURING CO., INC.

On July 16th, the Chesapeake-Camp Company, Franklin, Virginia, became the Camp Manufacturing Company, Incorporated. There will be no change in the corporate structure, and the officers of Chesapeake-Camp Corporation will continue in their respective capacities.

With this change, the two companies are consolidated under the name of the older one. Camp Manufacturing Company was incorporated under the laws of Virginia in 1887. The incorporators were: Paul D., James L., Robert F., and W. N. Camp. This company has conducted a chain of lumber manufacturing operations from its inception to the present time. The original saw mill is still operating at Franklin, Virginia, and during the intervening years the company has operated large saw mills, planing mills, wooden box mills, etc.

During the fifty-eight years the Camp Manufacturing Company has been engaged in its lumber operations, it has accumulated a very large amount of timberlands. The original growth timber has been taken off, and the company has been running for a number of years on heavy stands of second growth timber.

During the latter part of 1936, the Camp interests became identified with a movement to organize a pulp and paper mill, and the Chesapeake-Camp Corporation was organized. The Camp Manufacturing Company held a large portion of the land and timber acreage behind this new pulp and paper mill development, and holding a large portion of the stock of the paper mill, it gave the new pulp and paper mill large reserves in raw material available to the two companies: Camp Manufacturing Company, the parent company; and the Chesapeake-Camp Corporation, the new pulp and paper company. These companies operated as separate corporations from the incorporation of the Chesapeake-Camp Corporation the latter part of 1936 until the fall of 1944, when Camp Manufacturing Company was merged into and with Chesapeake-Camp Corporation.

The officers of Chesapeake-Camp Corporation, continuing as officers of the Camp Manufacturing Company, are:

President—J. L. Camp, Jr.
Vice President—Elis Olsson
Secretary-treasurer—J. M. Camp
Asst. Secretary-treasurer—B. J. Ray
Vice president in charge of Operations—Hugh D. Camp.
Vice President in charge of Sales—C. R. McMillen
Superintendent—K. M. Thorsen
Plant Engineer—W. C. Coker

The new setup puts the Camp Manufacturing Company, Incorporated, in a position to insure the continuous operation of its kraft pulp and paper mills, lumber mills, turpentine and tall oil plants.

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GRADUATE LECTURE COURSE ON PULP AND PAPER TECH.

A graduate lecture course on pulp and paper technology will be offered by the Department of Chemical Engineering of The Polytechnic Institute of Brooklyn, New York, beginning on October 4. The course will be under the direction of Robert S. Aries, chemical consultant and field director of the Northeastern Wood Utilization Council, and will consist of 30 lectures which will be given by Mr. Aries and invited specialists in the various fields of paper and cellulose technology. The lectures will be held weekly —Thursdays from 6:00 to 8:00 p. m.

Among the topics to be considered are the raw materials for pulp and paper, their requirements and economics. The sulphite, soda, and sulphate processes will be examined from their technological aspects. Miscellaneous pulping and pulp treating processes will be studied with relation to their present and potential importance. Topics such as bleaching, sizing, loading and filling, coloring, etc., will be considered from their theoretical and practical aspects. Emphasis will be laid on specialty and coated papers, the combination of plastics and rosins with paper, printing, and the correct methods of testing of pulp products.

Registration for graduate courses is scheduled for the week of September 24. Full details may be obtained by addressing Dean R. E. Kirk, Graduate School, Polytechnic Institute of Brooklyn, 85 Livingstone Street, Brooklyn 2, New York.

◆

▶▶▶ BECAUSE OF THE WAR, shipments of wood pulp were suspended on the Great Lakes. However, on July 11, these shipments were resumed when the Canadian freighter, Outarde, of Thorold, Ontario, landed a cargo of 216 tons of pulp at South Haven, Michigan. The pulp was consigned to paper mills in Kalamazoo.

◆

PILOT PLANT FOR PLASTICS NOW OPERATING COMMERCIALLY

The pilot plant constructed at Cornwall, Ontario, by Howard Smith Paper Mills Ltd. for the making of a specially developed plastic, has now been in operation on a commercial scale for several months. Production was begun on a small scale and gradually increased, as experience with the new material gradually leveled off into a definite "know how." It is understood that certain skills are yet to be acquired by additional technical workers before the mill can be operated at its full capacity. The present prospects, however, are that everything will be running smoothly and at full capacity within a very few months. The new plastic product is made from lignin derived from sulphite waste liquor from the pulp mill, and comes in sheets. The product is already on the market and is being used chiefly in the making of electrical insulating units and table tops.

Despite the continued labor shortage, Howard Smith Paper Mills continues to operate its pulp and white paper mills at close to 24-hour capacity, as there is no problem of markets for their regular products but rather a continual struggle to maintain production at highest possible level. The company has drawn up a program for future plant expansion and development which is being delayed solely by materials and labor shortages. Only minor replacement and plant improvement work is presently being done.

CINDERS at Hurricane Speed pack a WALLOP

Huge "Buffalo" Induced Draft Fan ready to take years of punishment.

Mighty Rotor and Shaft of "Buffalo" Induced Draft Fan showing thick steel plates and blades.

...that's why "Buffalo"

INDUCED DRAFT FANS are built to TAKE IT!

Drawing high-velocity storms of ashes from boiler fire beds year after year without let-up, Induced Draft Fans just *have* to be extra *tough* to stand the persistent erosion. That's why "Buffalo" rotors are designed with extra heavy blades and plates hot-riveted together for solid endurance . . . why they're designed to operate with MAXIMUM efficiency at moderate speeds for added years of practically attention-free service. When new rotors are finally necessary, "Buffalo" housings are easily "taken down" for speedy replacements! For complete description of "Buffalo" Induced Draft Fans, write for Bulletin 3190-B.

BUFFALO FORGE COMPANY

213 Mortimer Street **Buffalo, N. Y.**

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo" INDUCED DRAFT FANS

One German Paper Mill Escaped Demolition

The bombing and subsequent demolition of German industries did not touch some of the paper industry. . . . The above illustration shows a large German paper plant. The pulpwood piled in the yard marks it as a self-contained mill, but military censorship did not permit revelation of the location. . . . This picture was sent home by Lt. Weston C. Cooley, to his father, Chauncey Cooley, advertising manager of the American Writing Paper Corporation, Holyoke, Mass. Lt. Cooley, who helped occupy the mill as an officer of a 9th Armored Division tank battalion, found in the president's office samples of Eagle-A papers sent out of his father's advertising department twelve years ago. The Germans apparently had obtained them for analysis and comparison.

PROFESSOR SUES ALIEN PROP. CUSTODIAN FOR ELECTRON MIC. PATENTS

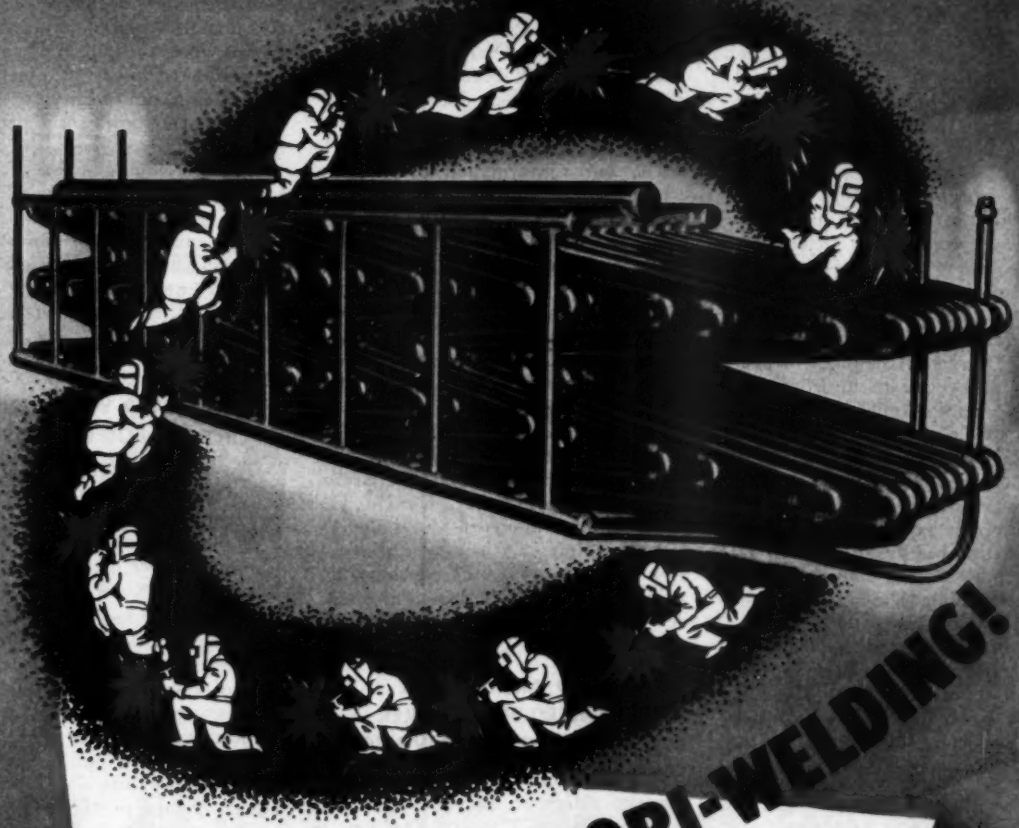
The efforts of Professor Reinhold Rudenberg to regain possession of his patents as the inventor of that dramatic and much publicized instrument, the electron microscope, is certain to cause a considerable flurry of interest in scientific circles. Set forth in basic U. S. patents Nos. 2,058,914 and 2,070,319 issued in 1936 and 1937, but having priority rights in Germany as far back as 1931, the patents cover the essential specifications for a device to give high electronic magnifications due to the focussing action of magnetic and electrostatic lenses.

In 1942, when the United States went to war with Germany, these patents were taken over by the Alien Property Custodian, shortly before their owner became a naturalized citizen of this country. He has commenced a legal action in the Federal Court in Boston, Massachusetts, against the Custodian, and against his former employer, Siemens-Schuckertwerke, for return of the patents to him. Although he was chief engineer of Siemens at the time he made the inventions, Rudenberg deposes that that concern had no rightful claim to his patents. He left the employ of Siemens, by "mutual consent" in 1936.

Dr. Rudenberg is now Gordon McKay, professor of electrical engineering at Harvard University. Filled with detestation of the Nazi regime, which had persecuted him and his fellow scientists, and had made untrammeled research impossible in Germany, he emigrated to England. After a stay of about two years, he came to America and at once set about fulfilling United States citizenship requirements. His outstanding scientific reputation won him a position on the faculty of the Harvard Graduate School of Engineering, and he was accorded full professorship.

The events which stimulated Rudenberg's ideas, and which finally resulted in a clear-cut and masterly patent disclosure are of interest not only in themselves, but because they reveal the creative imagination and the intellectual stature of the man. In 1926, his friend Hans Busch discovered that the electron rays emanating from a cathode in a vacuum tube can be concentrated to a focus by magnetic and electric fields of force; in other words, electronic "light" rays, vastly shorter than those of visible light, could be focussed by force fields.

It so happened that Busch's finding occurred but a few years before a member of Rudenberg's family was striken with poliomyelitis, which even then was thought to be caused



A MILE OF FLORI-WELDING!

1588 Separate Welds—This labyrinth of refrigerating coils would be the despair of many a welder. But to Flori's experienced, code-qualified craftsmen, it's just another routine job—despite the fact that every weld had to be ammonia-tight — hydrostatic tested to 100 lbs./in.²

Whether your requirements are exacting or simple, Flori's wide experience with such intricate plate and tubular steel fabrication is your guarantee of a better job.

IF IT'S FABRICATION--CONTACT FLORI

FLORI FABRICATION

THE FLORI PIPE COMPANY • ST. LOUIS 15 • CHICAGO 47

by some microorganism too small to be seen by any light microscope. The thought occurred to Rudenberg that it should be possible to form greatly magnified images of such infinitesimal bits of matter. Indeed, it is only due to the electron microscope that viruses have been definitely isolated and photographed. Rudenberg's completed invention grew out of his humanitarian desire to provide a means to probe the secrets of such vicious diseases as polio.

He seems to have been the first to realize the tremendous possibilities inherent in a microscope that could utilize "light" waves of the order of one-tenth of an Angstrom in length, as compared with 2,000 Angstroms which is the limit of resolution of the ordinary light microscope.

Beyond one or two modest statements in scientific journals, the ignored inventor of this marvelous instrument has heretofore made no attempt to press his claims in this country, and was obliged to submit to the sequestration of his patents by the Alien Property Custodian, when he was still technically a German subject. His efforts now are primarily to secure justly deserved recognition for his important conception of the electron microscope.

◆

GOULD PAPER NO LONGER MAKES NEWSPRINT—WILL READAPT ITS PROCESSES

After manufacturing newsprint for 51 years, the Gould Paper Company, Lyons Falls, New York, discontinued the manufacture of that product on July 1.

The announcement made by R. W. Shaver, president and general manager of the company, states that the company will change grades and readapt its processes to more profitable groundwood specialties. The products to be manufactured will be of considerable variety and will be produced in about the same tonnage as the present newsprint capacity of the mill.

The only information given out concerning the new products is a statement by Mr. Shaver that the new line will include a corrugated container for Mazda lamps to be used by the Army and the Navy. Other corrugated containers for government use will be manufactured.

Although actual incorporation of the company took place in 1892, the organization was not effected until 1894 by the late G. H. P. Gould. Upon his death in 1919, his son, the late Harry P. Gould, was elected to succeed him. His son, Gordon H. P. Gould, grandson of the founder, was elected president and general manager in 1938. He still continues as a director, but was succeeded as president by Mr. Shaver a few months ago.

◆

REMODELED AIR DRYER INSTALLED IN CROCKER DIVISION OF AWP CORP.

The American Writing Paper Corporation, Holyoke, Massachusetts, has installed in its Crocker Division a large air dryer which was removed from the Beebe & Holbrook Division and was remodeled, enlarged, and generally improved during installation.

The dryer is used chiefly to air-dry (cockle finish) Eagle-A bonds, onion skins and companion papers.

Among the notable features of the new air dryer are the automatically electrically controlled temperature regulators and the bank of recording thermometers placed at frequent intervals along the length of the drying chamber to assist the operator in maintaining uniformity of quality. Directly after drying, the paper is removed to a new high speed Clark-Allen overlapping cutter and Erie layboy which permits single sheet cutting.

The entire job of installing the large machine was carried out by Eagle-A engineers under the direction of F. H. Willemain, chief engineer.

◆

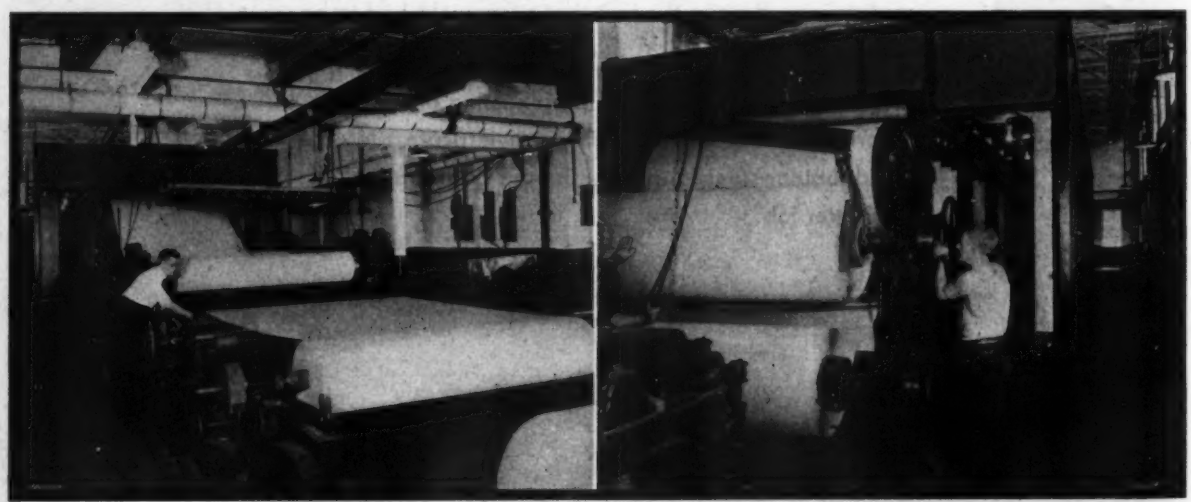
HYDROELECTRIC PROJECT IN VANCOUVER WILL FURNISH POWER FOR PROPOSED MILL

The honorable John Hart, Premier of British Columbia, reveals that formal decision on the development of a 50,000 hp. hydroelectric project at Campbell River has now been reached by the B. C. Government.

The Premier said that a large industrial organization had indicated requirements of from 8,000 to 10,000 hp. to proceed with the establishment of a new pulp mill, and that the new project would provide adequate power for the proposed mill. The name of the company was not specified, but rumor points to the projected pulp mill at port Alberni, British Columbia.

◆

▶▶▶ BROMPTON Pulp and Paper Co.'s new Red Rock mill, on the north shore of Lake Superior, is expected to start operations this fall, according to a company announcement. It was also stated that the final product will be kraft linerboard, instead of kraft pulp as originally planned.



LEFT—Howard Ferguson, superintendent in charge of newly-installed air dryer at Crocker Division of AWP Corporation, inspecting paper before it is introduced into sizing tub. RIGHT—Workmen at the opposite end of the dryer

PAREZ* LEADS THE PAPER PARADE

FOR NEW WET AND DRY STRENGTH PRODUCTS

Today PAREZ** 607 for wet and dry strength paper products is doing "above-the-line duty" meeting super-specifications for all military demands.

Heading the list is its use for wet-strength Army map paper. This paper meets the demands of high *wet* strength, high *dry* strength, super *fold* endurance, greatly improved *wet* and *dry erasure* so well, and improves printability of the sheet so much because of lack of waviness and curl, that all government agencies have adopted it. PAREZ is also going into papers for wet-strength meat wrap, Navy lens wiping tissue, wiping tissue to replace rags and text papers that resist wet thumbing and repeated fold for use in Navy instruction manuals.

Although today PAREZ 607 is still an allocated material, larger quantities are now available for civilian uses. Its performance for essential war papers shows you the improvements it will give your paper products tomorrow. If you would like to utilize PAREZ for your proposed postwar papers, small lots are currently available for experimental work without an allocation request. We shall also be glad to work with you on potential applications.

When Performance Counts... Call on Cyanamid

**Trade-mark of American Cyanamid & Chemical Corporation covering its synthetic resins for use by the paper industry. The processes under which PAREZ is applied in the production of wet strength paper are covered by U. S. Patents Nos. 2,291,079; 2,291,080 and 2,345,543 and U.S. Patent Application Serial No. 453,032.

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DISTRICT OFFICES: Boston, Mass.; Philadelphia, Pa.; Baltimore, Md.; Charlotte, N. C.; Cleveland, Ohio; Chicago, Ill.; Kalamazoo, Mich.; Detroit, Mich.; St. Louis, Mo.; Azusa, Calif.; Seattle, Wash. In Canada: Dillons Chemical Company, Ltd., Montreal and Toronto.

SECTIONS OF WEST AND NORTHWEST SUFFER HEAVY DAMAGE FROM FOREST FIRES

A disastrous forest fire which raged over a radius of 70 square miles left a blackened vista where timber growth had been in northwest Oregon. Fires from a number of smaller blazes united to form one great roaring inferno. The Wilson River blaze burned for several days before joining other fires.

The damage of such a conflagration is inestimable, considering the loss of the timber alone. Several towns were threatened, but heroic work on the part of fire fighters, soldier and civilian crews prevented serious casualties.

About the same time another great timber blaze raged in Eastern Idaho. This fire, caused by lightning, burned more than 100 acres. This fire was prevented from spreading due to what officials called the "biggest aerial attack ever made on a single forest fire."

Fifty-two army paratroopers from Pendleton, Oregon, and 40 smoke jumpers from Missoula, Montana, were among the fire fighters.

After having been closed for nearly a week due to acute forest fire conditions, the forests of Vancouver Island were reopened on July 16 following an announcement that all Blazes in British Columbia were under control. The cancellation of the closing order permitted 8,000 woodsmen to return to their jobs. Scattered showers aided fire fighters in the Adams River district where 500 acres of scrub timber were burned.

◆

PAPER MEN FROM SOUTH AFRICA GUESTS OF MILL OFFICIALS IN VANCOUVER

Distinguished visitors from South Africa recently were entertained by paper mill officials in Vancouver, British Columbia. In the visiting party were: Colonel J. J. Kruger, paper controller of South Africa; C. B. Pearce, trade advisor under the paper control, and R. S. Baker, secretary of the paper control administration. A. N. Satterthwaite, New Zealand representative of Pacific Mills, Ltd., visited Vancouver with the group.

The visitors were welcomed by Henry Pim, vice president and sales manager of Pacific Mills, Ltd., Vancouver. Paul Cooper, president, and J. A. Young, vice president and secretary-treasurer of the Pacific Mills, entertained the party.

A group of men well-known in the pulp and paper industry joined in taking the guests on a trip north along the coast to view the operations of Pacific Mills, Ltd., at Ocean Falls, British Columbia. In this group were: Robin Bell-Irving, Powell River Paper Company, Ltd.; Don Humphrey, British Columbia Pulp & Paper Company, Ltd.; Harvey Lewis, Sorg Mills; and Elmer Herb, Westminster Paper Company, Ltd.

The visitors expressed the opinion that both South Africa and New Zealand would be more dependent on Canada for their pulp and paper supplies than before the war, one reason being that most of the Scandinavian supply would pass into the European markets. Colonel Kruger said, "We wish to see increased trade, not a decrease, with you. During the war you opened new markets with us and it is up to you to keep them."

◆

CEMENT WITH LIGNIN ADDED LASTS LONGER THAN PLAIN CEMENT

The results of scientific research recently completed by chemists at Ohio State University and published currently in *Industrial and Engineering Chemistry*, journal of American Chemical Society, indicate that concrete in the $20 billion construction program planned for the first two postwar years will last much longer with far less maintenance expense if a by-product of the paper industry is added to the cement used.

Conducted by Dr. Wesley G. France, nationally recognized authority, and Fred. M. Ernsberger, a research fellow now in service, this investigation shows that when cement is placed in water many of the particles clump or flock together. Since tests have shown that the best results are gotten from cement only when each of the countless particles is wet all over, this tendency of the particles to bunch together greatly reduces their combined effectiveness or efficiency in concrete.

The second step of this investigation showed that the clumps are broken up when a small amount of a lignin product, made from paper mill waste, is added. This product calcium lignosulphonate, disperses the cement particles by electrostatic action.

Tests made for federal departments have proved that concrete produced with dispersed cement is stronger, less porous and lasts four to five times longer than when made with plain cement.

Dispersed cement providing these new standards in concrete already has been used in millions of yards of concrete for buildings, industrial plants, bridges, dams, airports, reservoirs, filtration plants and highways.

Touching the pocketbook of every individual and corporation by opening the way to lower cost, longer life concrete, cement dispersion is looked upon as one of the important recent developments.

◆

CHINESE PAPER MILLS ALREADY PLANNING TO RESUME WHEN WAR IS WON

A late press release states that although paper production in China is at a standstill, due to inability in wartime to import vital foreign commodities, it is known in Chungking that at least one large Chinese paper manufacturing concern is ready to go the minute the Japs are beaten.

The company referred to is said to have accumulated a reserve of $700,000 United States currency to be used as initial payments for purchases of American made equipment. This prospective buyer of paper mill equipment will send a representative to the United States shortly to confer with American pulp and papermakers and to place orders for equipment.

◆

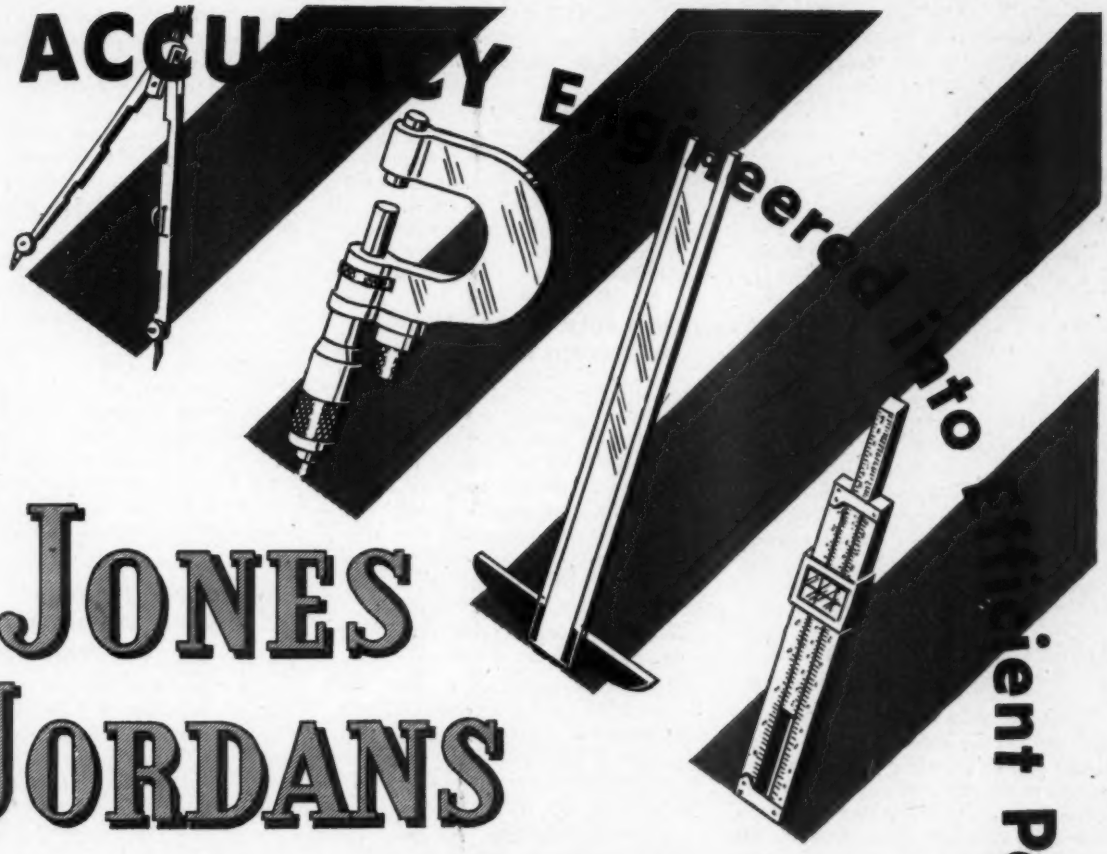
▶▶▶ THE NEW BARKER PLANT at the Hawley Pulp and Paper Company, Oregon City, Oregon, is now in operation and proving successful. It is barking enough logs in six hours to keep the wood room supplied for 24 hours. The capacity is about 20,000 log feet an hour, using logs ranging from 9 to 52 inches and from 8 to 22 feet in length. A large dock extension has been built in connection with the barker plant for a postwar project which will include centralizing all wood room operations there.

◆

WOOD PRODUCTS REPORT OUT

A report of the Conference on New Developments in Wood Products has recently been issued by the New York State College of Forestry at Syracuse University. The conference was held at the College on October 6-7, 1944, and was attended by some 500 representatives from the industries and professions. Many exhibits were presented showing new developments in the use of wood and its derivatives.

The booklet includes papers that were presented on—"The Influence of Modern Glues on the Utilization of Wood," by W. F. Leicester, president of the Casein Company of America; "Wartime Wood Products in Sweden," by Dr. E. C. Jahn, professor of forest chemistry at the College; "Methylolurea Treated Wood," by Dr. J. F. T. Berliner of the E. I. du Pont de Nemours & Company; "Recent Developments in Fire-Resistant Treatment of Wood," by F. A. Hart-



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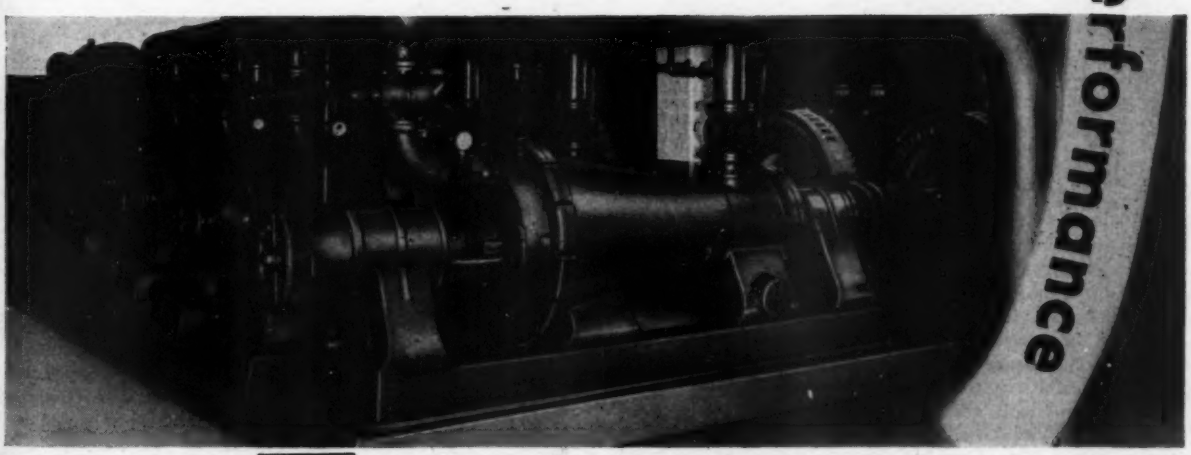


Jones

GEARED FOR WAR PRODUCTION

E.D. JONES & SONS COMPANY-PITTSFIELD, MASS.

Builders of Quality Machinery for Paper Mills

man, vice president of the Protexol Corporation; "High Frequency Heating Applied to Wood Products," by P. D. Zoltu, chief engineer of the Girdler Corporation; "New Uses of Glued-Laminated Timber Structures," by Verne Ketchum, chief engineer, Timber Structures, Inc.; "Synthetic Resin Laminating for Marine Use," by C. D. Dosker, vice president Gambel Brothers; "The Problem of Wood Waste," by Carl Rishell, director of research, American Forest Products Industries; "Recent Developments in Cellulose and Lignin Plastics," by Dr. Floyd C. Peterson, Cellulose Products Division, Dow Chemical Company; "New Developments in Pulp and Paper Products," by Lyman Beeman, general manager, St. Regis Paper Company; The Outlook for Wood-Using Industries in New York State," by Dr. M. P. Catherwood, Commissioner, State Department of Commerce, Albany, N. Y.

◆

STANDARD SIZE NEWSPAPERS RETURN TO HOLLAND

The Netherlands has been known for its well-written, reliable daily press. Before the war such large newspapers as *De Telegraaf*, the *Algemeen Handelsblad*, and the *Nieuwe Rotterdamsche Courant* were known to journalists all over the world for their splendid news coverage. Since the liberation these newspapers, and many others besides, have been under suspension because of their continued publication during the Nazi occupation. As the result of a purge by a Special Press Council, however, they will soon resume publication—although with entirely new staff and new financial interests.

Ever since the autumn of 1944, when Holland's southern provinces were freed, efforts have been made to restore the daily and periodical press. The most serious handicap has been the critical shortage of newsprint; paper was so scarce that newspapers were appearing in a variety of sizes. The larger the circulation, the smaller the size of the daily. Increasing newsprint stocks, however, now permit the publication of standard size newspapers. This means that dailies will be allowed to print four-page standard size issues twice each week, on Wednesdays and Saturdays. On other days they will print two-page issues.

Officials added that the paper situation has not improved sufficiently yet to allow the printing of unlimited editions of books, pamphlets and other publications, including textbooks. Everyone of these items requires the sanction of the Paper Control Board.

▶▶▶ A BRANCH SALES office has been opened in Pittsburgh by International Paper Products Division of International Paper Company, Robert W. Lillie is district sales manager, and his territory covers the State of Pennsylvania, with the exception of greater Philadelphia. Mr. Lillis was formerly connected with Dixie Cup Company, Easton, Pennsylvania. The new office is located at 1026 Farmers Bank Building.

◆

WOOD PULP FRAUD RING UNCOVERED IN EASTERN MILL

A $100,000 wood pulp fraud ring which has operated for the past 18 months in the plant of an eastern paper manufacturer has been broken up. The local district attorney and state police arrested the four men involved: two of the mill's employees, and two lumber dealers. The men were charged with grand larceny and released on heavy bail.

The story behind this fraudulent program was about as follows:

Authorities said that a plan had been worked out by the men and put into operation about a year and a half ago. It is estimated that thousands of dollars monthly were taken from the company by the ring.

For years past, the company has used wood bought locally by dealers who operated in behalf of the company. The wood was taken to the plant by trucks where it was scaled by company employees who made out a slip and gave a copy to the truck driver. The number of cords and the kind of wood shown by the scalers' slips was used in computing payment to the dealers—the price ranged from $18 to $23 per cord, depending on the kind of wood.

For some time, company officials noticed that more wood apparently was going through the digesters at the plant than the rated capacity. An investigation revealed that the scalers were making out slips and putting through loads "that never were received by the company, and existed only in the minds of the men carrying out the scheme. Original slips for loads were turned in to the company and a copy given to the dealer by the scaler. For each load, the company paid the dealer $100 to $140. The arrangement between dealers and scalers netted the scalers one-half the amount paid by the company for the load and the balance was retained by the dealer, according to the findings.

The company's employees who were apprehended were scalers at the plant.

Evidence which helped to uncover the scheme was the exceptional prosperity of both men. One had a mounting bank account, the other purchased considerable property. It is claimed that all parties involved have signed confessions stating the manner in which the transactions were carried out. The company auditors have only estimated the loss—a complete check may reveal it is higher than they thought.

◆

▶▶▶ A PLANT IN Watertown, New York, has been acquired by the Paper Division of the Continental Can Company, Inc. The property consists of a two-story concrete building. Local factory personnel has been hired and trained. Machinery has been installed and the plant is now operating. Two full automatic production lines are manufacturing fiber side wall metal top and bottom cans.

◆

LITIGATION OVER DAM IN LAKE GEORGE PERILS I. P. CO. WATER SUPPLY

The ownership of land beneath a dam at the outlet of Lake George, in New York State, has been brought into court, but no decision has yet been given. Probable action resulting from a verdict in this case, might threaten the life of the International Paper Company mill at Ticonderoga (N.Y.), since the mill depends upon water from Lake George to manufacture its products.

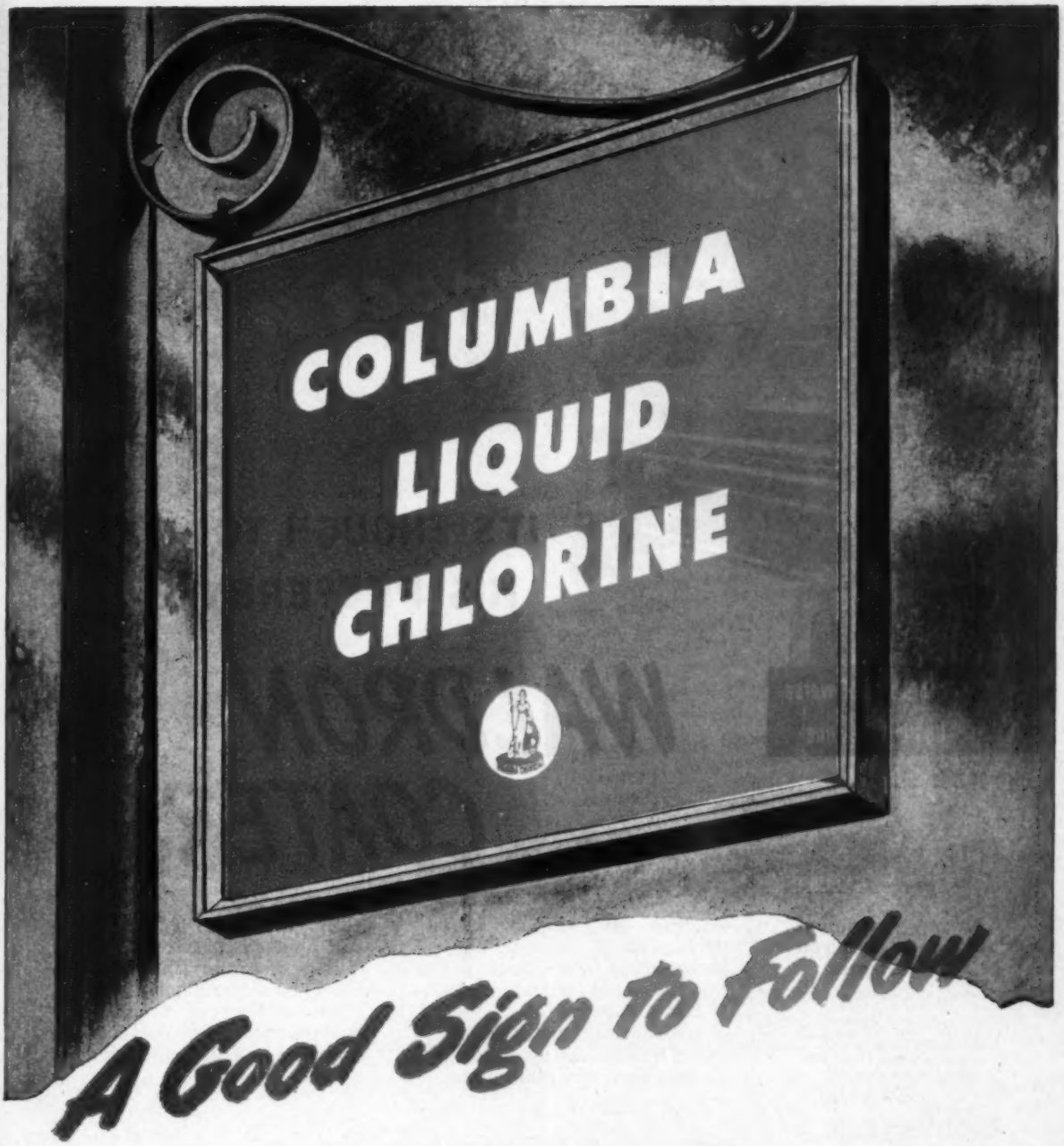
Since the city of Ticonderoga receives large tax payments from I. P. Company, the removal of the dam, and interruption of the paper mill's water supply, would affect the town seriously.

◆

▶▶▶ TRANSFER of the purchasing department of the Powell River Company from Powell River (B. C.) to the head office of the company in Vancouver (B. C.) has now been completed. R. A. Baker, purchasing agent, Oscar, Smith, assistant purchasing agent, and other members of the staff of the purchasing department at Powell River have moved to Vancouver.

◆

▶▶▶ PAPER BAGS will be manufactured in Newfoundland as soon as a factory now under construction by a recently organized company has been completed and trial runs have been made. This report, emanating from Canada, has been published in *Foreign Commerce Weekly*. With the initial equipment, bags made from sulphite paper, ranging from one quarter pound to three pounds will be manufactured.



A Good Sign to Follow

As military requirements relax, increasing quantities of Chlorine will become available for normal use. Columbia—always alert to serving its customers—can be relied upon as a superior source of this important basic chemical. Supplied in all types of equipment including the new 55-ton single unit tank cars.

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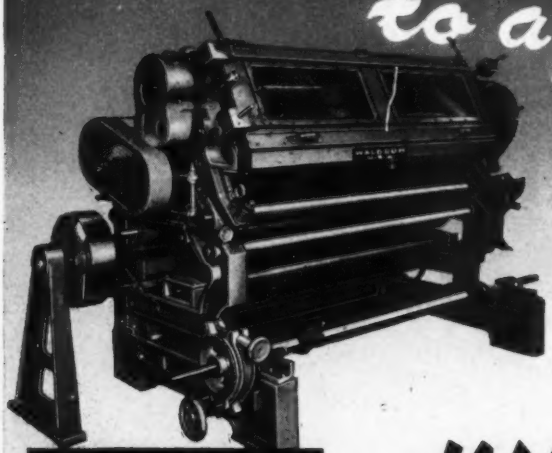
What's 1/10,000 of an inch to a paper maker?



Waldron Horizontal Reverse Roll Coating Machine

IT'S ENOUGH TO JUSTIFY HIS PREFERENCE FOR

WALDRON COATERS

Among Prominent Users of Waldron Coaters are:

American Coated Paper Corp.
American Coating Mills
Appleton Coated Paper Co.
Champion Coated Paper Co.
Consolidated Paper Co.
Hampden Glazed Paper Co.
Holyoke Card & Paper Co.
Martin Cantine Co.
Nashua Gummed & Coated Paper Co.
National Folding Box Co.
Standard Coated Products Co.
And many others.

Coatings metered to one-ten-thousandth of an inch can be secured only with rolls ground as fine as those provided in the Waldron Coating Machines. It is not surprising that experienced paper makers use more Waldron Coaters than any other make.

They know what it takes to assure that solid, smooth uniform quality of coating that Waldron Coaters consistently produce. Made in Knife, Combination Roll and Knife, Roll and Reverse Roll types. Full particulars will be sent on request.

Ask for full details on the new Waldron Micro-Jet Coater (patents pending) . . . a major advance that will speed up production of coated paper. *When there's better coating it will be done on Waldron Machines.*

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Printing Machines
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Waxing Machines
Winders and Slitters
Special Design Machines

WALDRON
Paper Converting Machinery

For those smaller jobs too . . .

there are the **ROSS**

AUXILIARY SYSTEMS

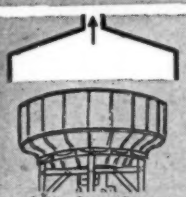
Although not always as evident as the major equipment items in a mill, there are numerous pieces of auxiliary equipment that contribute a large part of its operating efficiency.

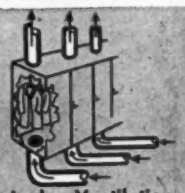
Properly cooling a motor, a generator or calender stack, guarding against dust or loose particles being carried on the sheet holding material in line on the conveyor tapes after the cutter—these are but a few of the steps taken by progressive mills to prevent loss of time, reduce broke, avoid damage to equipment and improve quality of product.

ROSS Auxiliary Systems to handle all such requirements are given the same care in design and construction as that which characterizes the famous ROSS Air Systems for major production facilities.

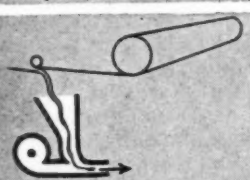
Dust System

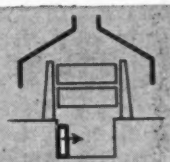
Grinder Exhaust

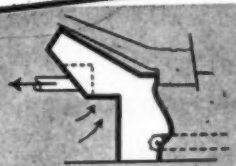

Hydrapulper System

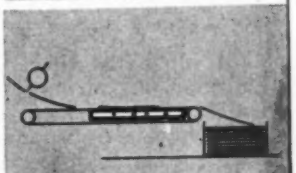

Locker Ventilation

Generator Cooling

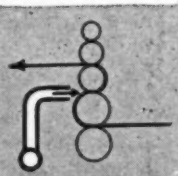

Trim Conveying

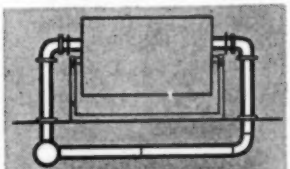

Pit Cooling

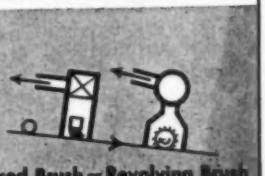

Boiler Front Dust System


Sheet Suction

Motor Cooling


Calender Cooling


Foam Exhaust System


Fixed Brush—Revolving Brush Dust Systems

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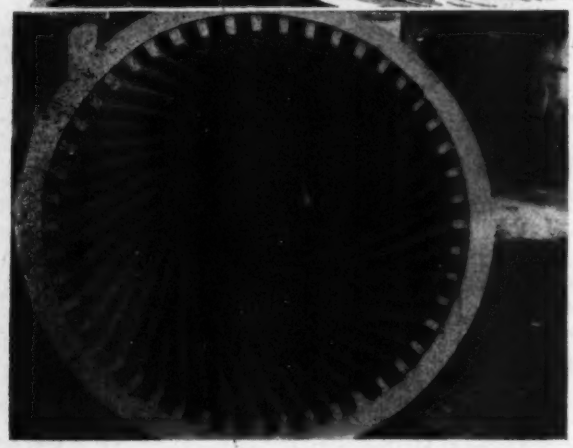

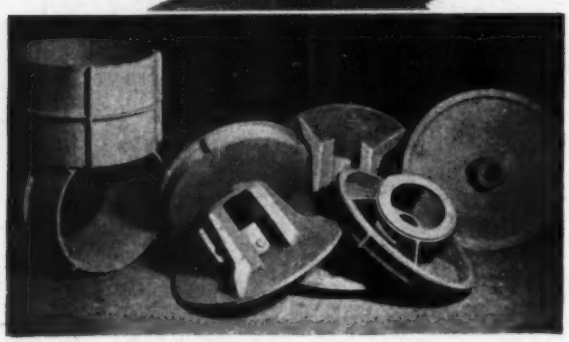

(*Above*) Stainless steel (12-14% Cr) casting weighing 900 lbs., typical of much of our production for paper mills. (*Right*) Special castings of Durco KA2SMo used in a high quality pulp conditioning installation.

In pulp mills where weak sulphuric acid is formed, as during intermittent operation of digesters, equipment built of DURIMET is without equal. There is no other alloy that has the same high corrosion resistance under these conditions.

In many sulphite mills, DURCO KA2SMo is being used most satisfactorily for handling hot sulphite liquors. To the best of our knowledge and belief, there has never been a failure of DURCO KA2SMo due to intercrystalline corrosion.

For instance, a manufacturer of paper mill machinery designed housings for the impeller and the shaft of a battery of circulating agitators to be cast of DURCO KA2SMo. This gave them maximum strength and machinability and guaranteed them against corrosion from the traces of chlorine left in the bleached pulp.

Some paper mills buy liquid alum; some use dry alum with an alum dissolving system. In either case, DURIRON dissolving and/or distributing equipment gives complete protection against corrosion and product contamination. Manufacturers of aluminum sulphate (paper maker's alum) have found DURIRON equipment their best insurance against iron pickup and frequent replacement.

DURICHLOR is another iron alloy whose special property is a high resistance to hydrochloric acid and chlorine solutions, so it is favored for equipment handling bleach solutions in paper mills.

Pumps, valves, pipe and fittings, dissolving jets, digester fittings, strainers, as well as special castings made to your own designs, are available in the Durco corrosion-resisting alloys. We will gladly quote on your requirements.

ARMY (E) NAVY

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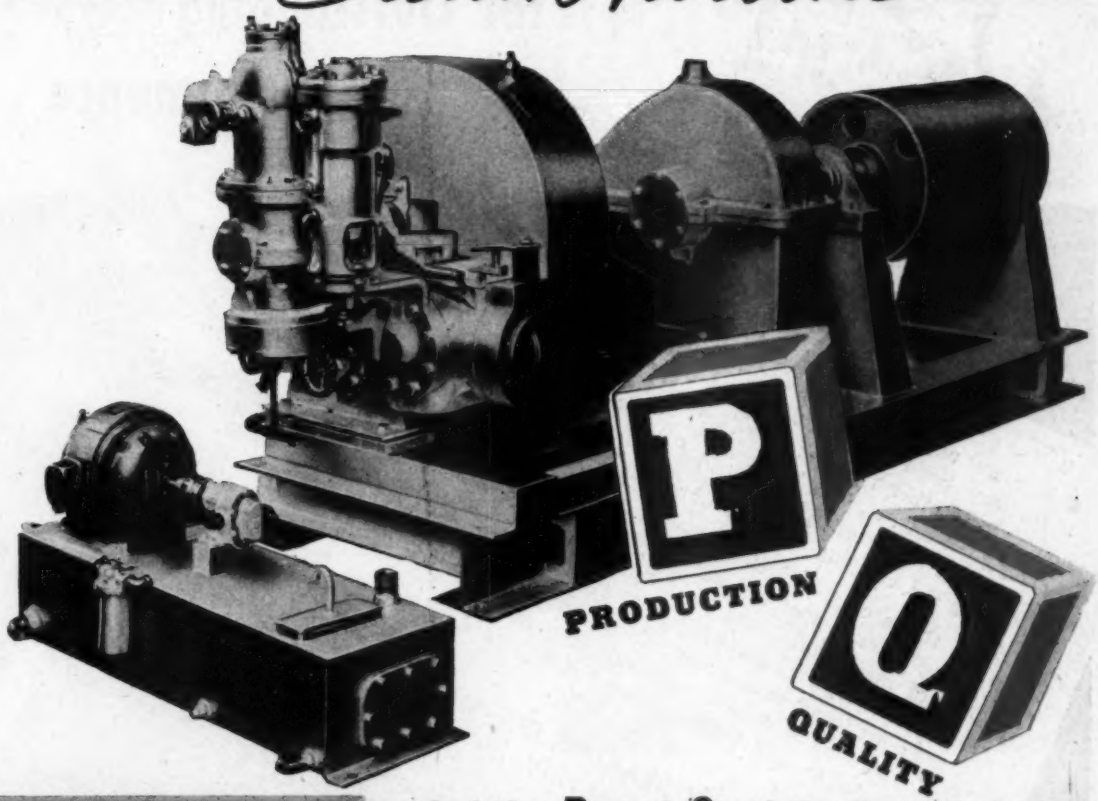
ALLOYS & EQUIPMENT

DURIMET · DURCO STAINLESS STEELS

THE DURIRON COMPANY, Inc. **DAYTON 1, OHIO, U.S.A.**

WESTINGHOUSE *Steam Turbine* DRIVES



Advantages of Westinghouse Steam Turbine Drives

PRECISION GOVERNING . . . over speed ranges required. Holds speed settings indefinitely.

CONSTANT SPEED . . . with all variations in load, inlet pressure, superheat and exhaust pressure . . . unaffected by variations in oil temperature or reservoir oil level.

LOW OPERATING COST . . . minimum attention, lubrication and maintenance . . . using by-product power.

SIMPLICITY OF OPERATION . . . easily understood and operated by the machine crew.

MEMO *Re-Replacement for worn out drives— Suggest you investigate (W) Steam Turbine Drives* J. S. R.

mind the P's and Q's of the Paper Industry

PRODUCTION and QUALITY together, in practically all paper mills, are dependent upon a smooth flow of power. With war production's peak loads, many drives—particularly the badly worn reciprocating engines—are overdue for replacement by modern smooth-power-flow steam turbine drives.

Westinghouse Steam Turbine Drives for paper machinery provide this power constant that keeps output consistently at a maximum. An important reason for this unwavering power is its control by a Westinghouse Mechanical-Oil Relay Governor. It holds the power flow and speed at constant value and accordingly maintains uniformity of product. The result: top quality, top production and top efficiency.

Westinghouse Steam Turbine Drives are available over the entire range of horsepower, speed and steam conditions encountered in paper mills. When analysis of heat and power balances suggests the use of Steam Turbine Drives, specify Westinghouse for lowest cost by-product power. For complete information call your Westinghouse office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-94690

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But that's only half of the story. Rollway Right-Angle Loading splits compound loads into the two simple components of *pure radial* and *pure thrust*—each of which is carried on a separate set of rollers. Total load magnitudes per bearing are lower, and are carried perpendicular to the roller axis. There are no oblique resultants, no complicated stresses. Stress analysis and bearing computations are simpler *and more exact.*

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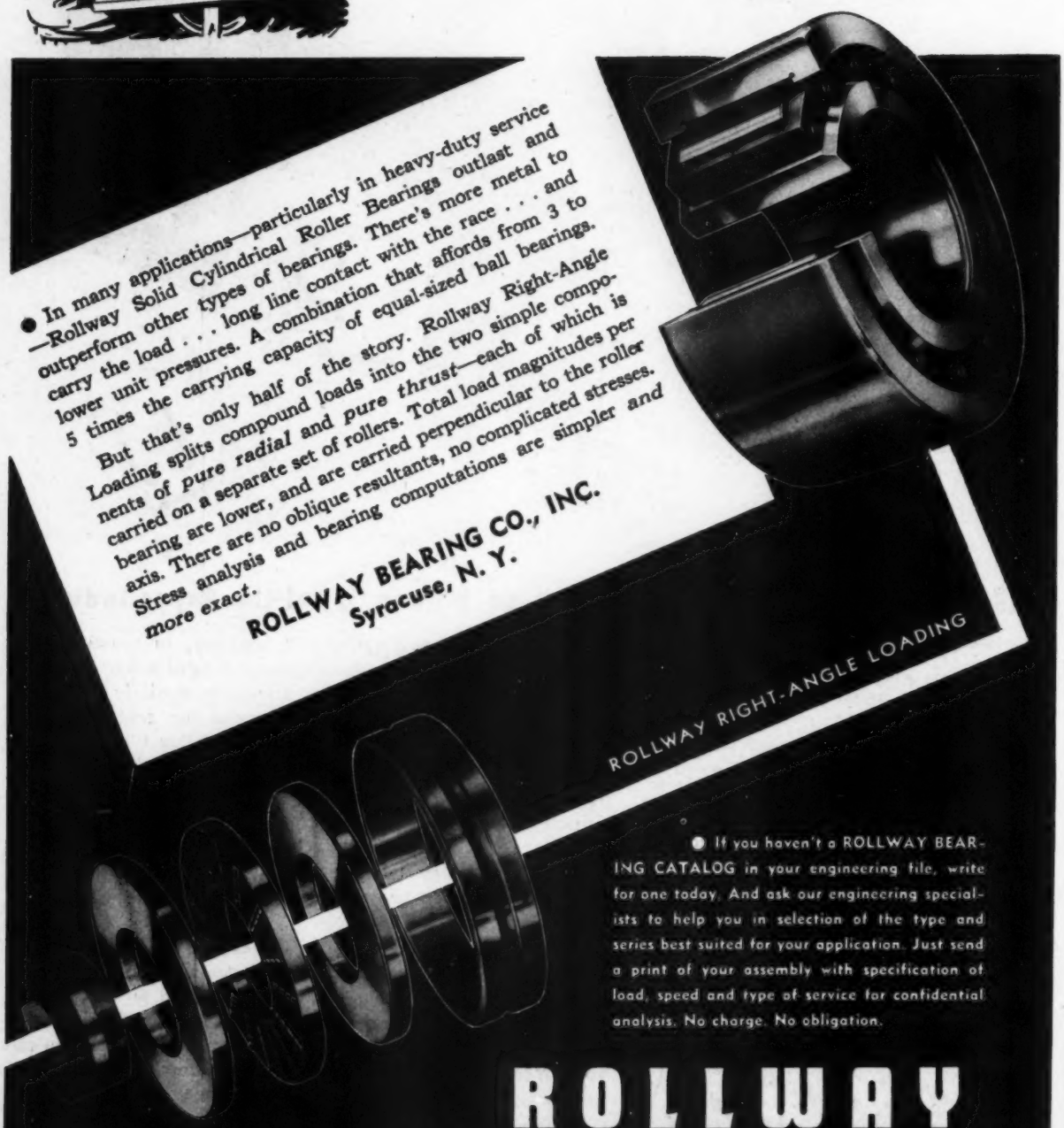

● If you haven't a ROLLWAY BEARING CATALOG in your engineering file, write for one today. And ask our engineering specialists to help you in selection of the type and series best suited for your application. Just send a print of your assembly with specification of load, speed and type of service for confidential analysis. No charge. No obligation.

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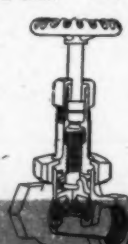
BUILDING tomorrow's wakening giant

After war's final "cease-firing", look for the building industry to go places . . . for vast cities-within-cities to take shape. They're on drafting boards today.

Air conditioning and ventilating will be widened to include removal of dust, bacteria and odors from the atmosphere by unit-type air sanitation equipment. On the upswing will be radiant heating, zoned heating, service hot water, spot cooling units . . . gas air conditioning which regulates humidity . . . a single heat pump system which heats buildings or cools them as desired.

Controlling liquids and gases in miles-on-miles of tomorrow's piping will be thousands and thousands of Fairbanks Valves. They will have been selected because of topflight past performance . . . because architects and engineers know they can expect freedom from failure when a Fairbanks is installed.

Whether it's a small bronze valve or a huge iron body gate valve with a 24-inch opening the name Fairbanks stands for sound engineering, careful chemical and metallurgical control of alloys, ample metal for the job. The full line is given in catalog "42" which will be sent you if you ask for it. If you need special assistance with individual problems of valve selection and application, call on the facilities of the Fairbanks Engineering Department.



THE fairbanks COMPANY

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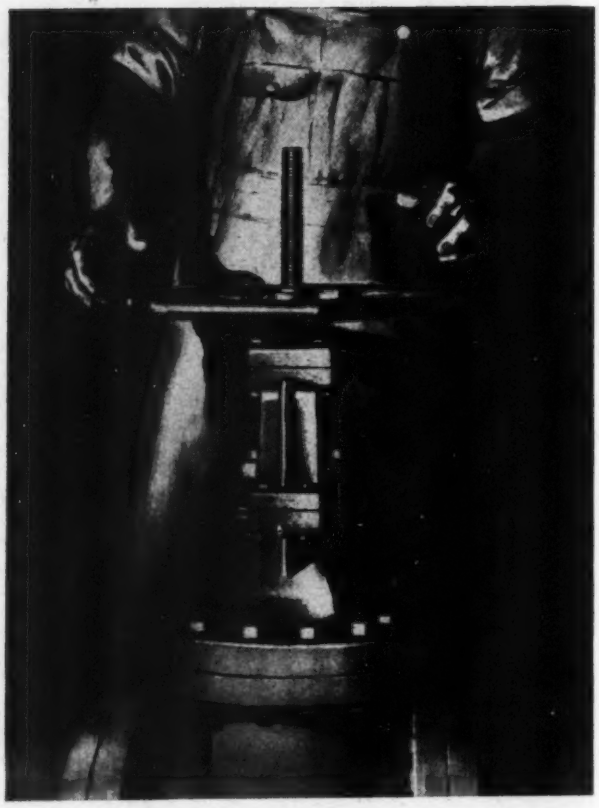
How Many of your Valves are "Booby Traps"?



Worn-out valves at the critical control points on your pipe lines are veritable "booby traps". They may "let go" suddenly, causing high losses in materials controlled, shutdowns of important processing lines, and serious danger to personnel. Or, they may limp along at low efficiency, causing steady losses that would pay for replacement many times over.

Wartime service loads, under abnormal operating conditions, have placed thousands of valves on the retirement list . . . worn beyond the point where they can be satisfactorily and economically reconditioned. How many are still in your pipe lines?

"NO 'BOOBY TRAPS' ON MY LINES!"

With the Jenkins Valve Record Sheets you can keep continuous data on any valve's condition, and tell when it will cost *less* to replace it.

Set down the condition of all important valves at each periodic inspection, and the frequency and costs of repairs and parts renewed.

For sample Record Sheets, send the coupon below.

Keep Records of Critical Valves

The best way to find when valves have outlived their usefulness — before they cause trouble — is to keep adequate maintenance records. Jenkins Engineers have prepared useful "Valve Record Sheets", available on request, to help you check and record the condition of your valves, and find the potential "booby traps".

Make Replacements with Jenkins Valves

Extra value is built into every Jenkins Valve by better materials, better design, better workmanship. To make sure of the *lowest cost in the long run*, select the replacements you need from the Jenkins Catalog . . . over 600 patterns for every service.

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Please send me a set of the Jenkins "Valve Record Sheets"

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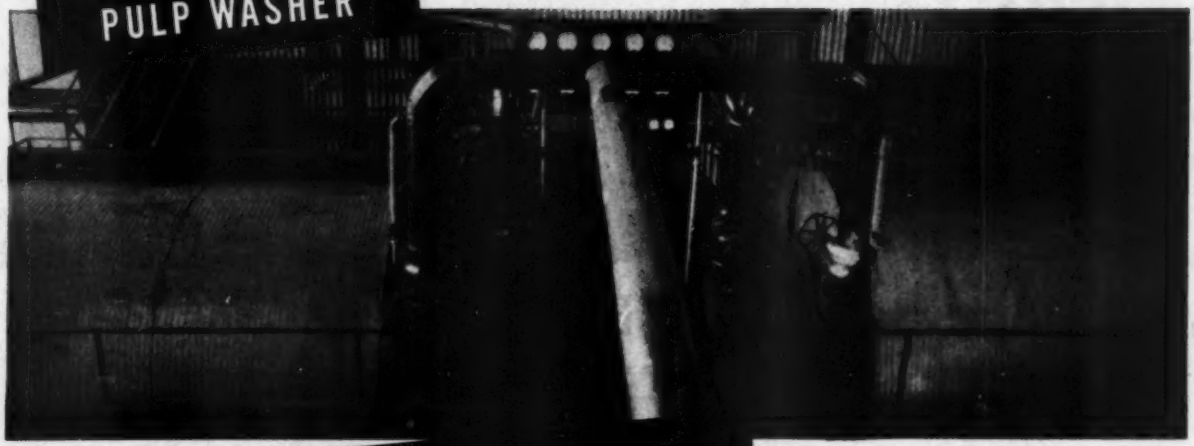
Sold Through Reliable Industrial Distributors Everywhere

ONE SWENSON-NYMAN PULP WASHER DOES THE WORK OF TWO

(and sometimes three) Ordinary Washers



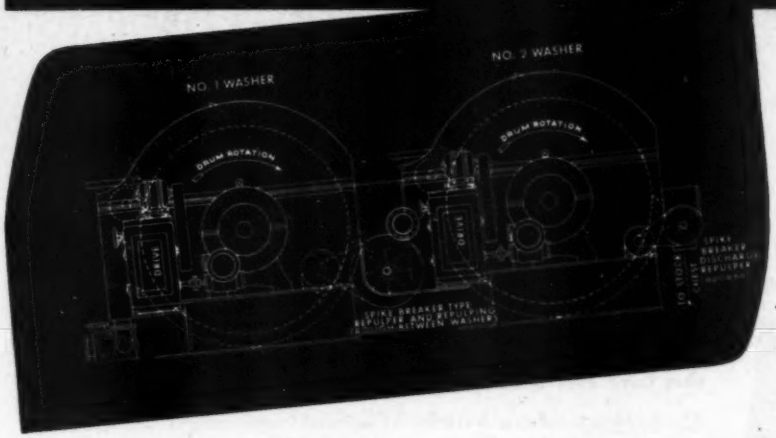


Diagram showing Swenson-Nyman two-drum installation for four-stage washing.

The double efficiency found in Swenson-Nyman Pulp Washers is obtained by two-stage washing on a single drum. Independently valved compartments each operate with a separate vacuum. The vacuum is distributed uniformly across the entire sheet at all times.

Other features: Washing area twice as large as the sheet forming area; backwashing entirely eliminated.

For kraft, sulfite, and soda pulp mills, Swenson-Nyman Pulp Washers are made in capacities up to 200 tons per 24 hours. Swenson engineers will be glad to determine the equipment best suited to the requirements of your mill after making a careful analysis. Write for Bulletin F-104 today.

OTHER SWENSON EQUIPMENT FOR ECONOMICAL PULP MILL OPERATION INCLUDES

- Black Liquor Evaporators
- Lime Sludge Filters
- Causticizing Equipment
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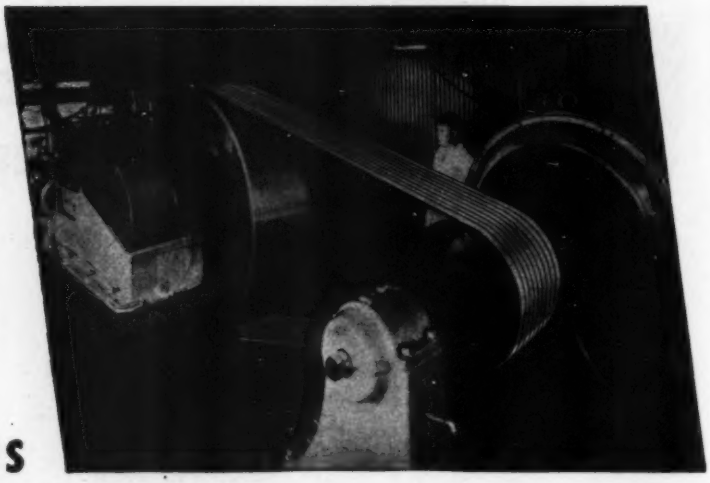
Right Now!



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That is a strong statement but it is simply a *fact*—
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- Every improvement developed by Gates for these Army V-BELTS has been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.

You have not had to wait until after the war for these improvements for the simple reason that more efficient V-Belts have been an important factor in increasing essential war production. That is why your standard Gates Vulco Ropes are today the best V-Belts that have ever been delivered to you.

In addition, where V-Belts of special construction are required, your Gates Rubber Engineer is in position to supply a Gates V-Belt that is precisely engineered to meet your special needs. You need only pick up your phone book and look under the heading "Gates Rubber." The Gates Rubber Engineer will bring to you, right in your own plant, the very latest advances in V-Belt construction and in drive operation as well.

IN ADDITION--

Gates also makes these special belts to meet exceptional service needs.

- Rayon Cord V-Belts
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- *Special* Synthetic V-Belts
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All Gates V-Belts are Built With The Patented CONCAVE SIDE

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Exhaustive tests have shown that operators of Black Liquor Evaporators can avoid expensive down time by replacing carbon tubes with Timken Seamless Tubes of 5% Nickel Steel. Because these Timken Seamless Tubes have been specially designed to resist the corrosive conditions encountered in Black Liquor Evaporators, they provide maximum life per dollar invested.

Whether you plan new construction or replacements, specify Timken Seamless Steel Tubes. They are uniform in size, composition and structure and are of high quality because every step of their manufacture is under the precise control of one organization that melts the steel, rolls the billets, and pierces the tubes.

A request on your firm's letterhead will bring specifications of Timken Seamless Tubes of 5% Nickel Steel. Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN
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Gravity is cheaper than STEAM...

You rely upon gravity, the cheapest power in the world, to carry off the water that is squeezed from the sheets at the wet end of your paper machines. At the other end of the same machines you rely upon steam, which costs plenty, to evaporate the remaining water.

It is common sense to use gravity for all you can get out of it and to keep your fuel bills as low as possible—in other words, to equip your machines with Hamilton Felts.

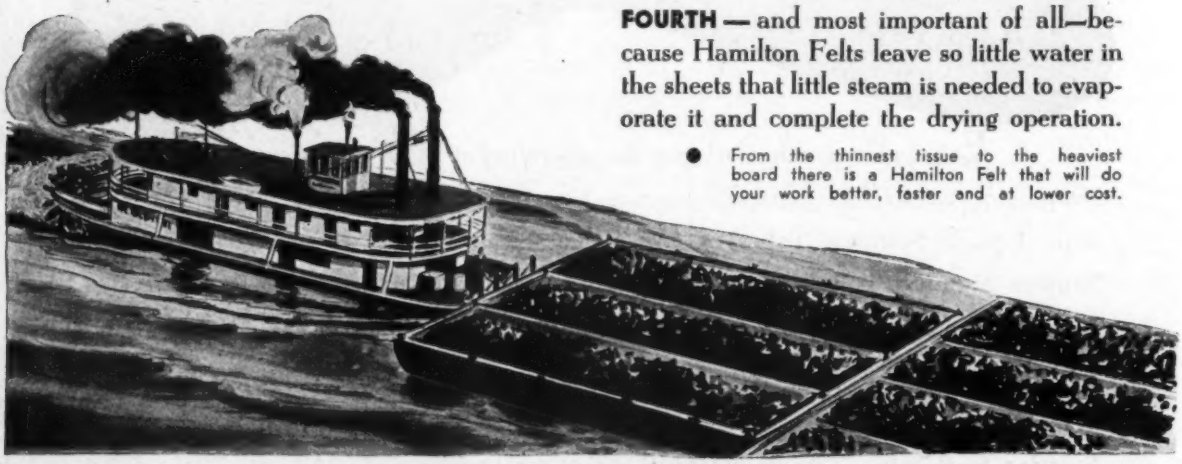
FIRST — Because Hamilton Felts permit you to run your machines faster — to increase tonnage.

SECOND — Because Hamilton Felts give stronger and more uniform formation to your product—less broke—fewer ends.

THIRD — Because Hamilton Felts permit you to apply more squeeze at the couch, removing more water to be carried away by gravity.

FOURTH — and most important of all—because Hamilton Felts leave so little water in the sheets that little steam is needed to evaporate it and complete the drying operation.

- From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.



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- Established 1858 -

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PITTSBURGH, PA., *and Everywhere*

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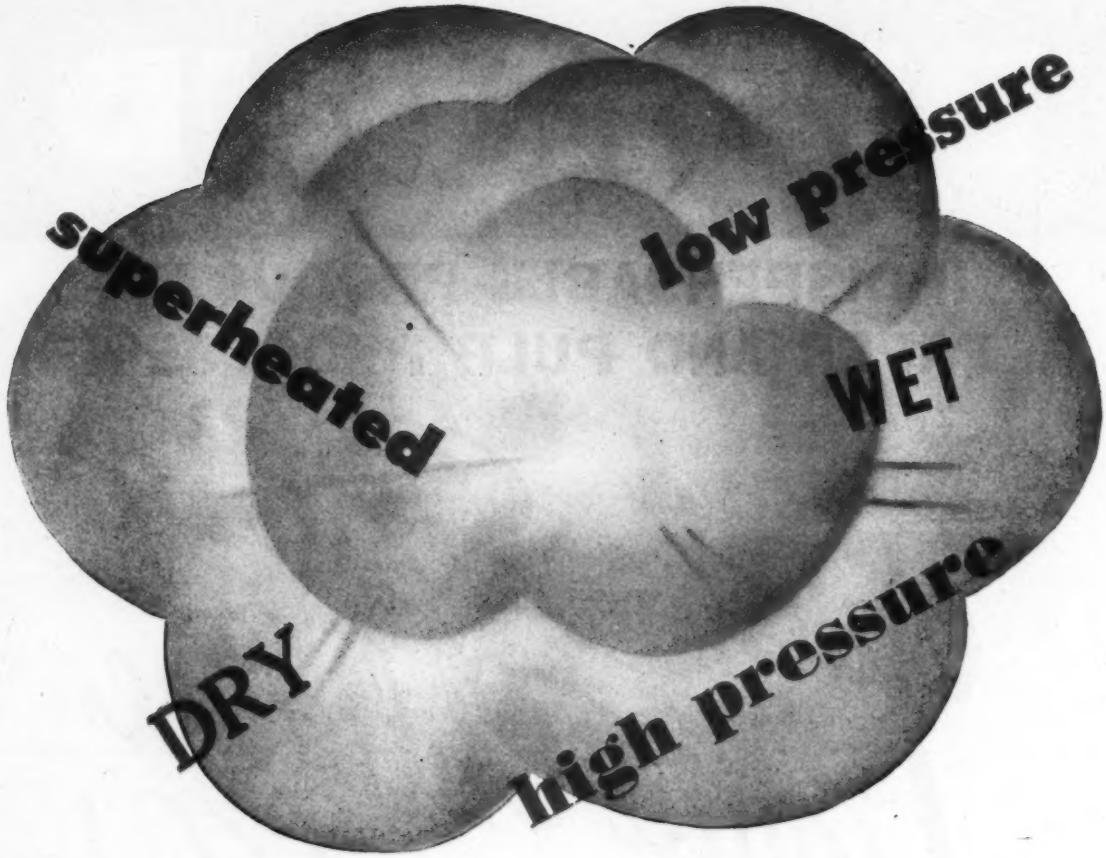

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AMONG other qualities, two are essential to assure effective steam cylinder lubrication with minimum oil consumption. The oil must (1) *atomize completely* and (2) *adhere to cylinder walls.* You get these and many other benefits in all Texaco steam cylinder oils.

However, selection of the right oil for your particular steam engine depends on the operating conditions of that particular installation. Different viscosities and compoundings are necessary to meet different conditions. That is why there is a complete line of Texaco steam cylinder oils to meet the requirements of every operating condition in every type of steam engine, new or old.

Whatever the steam pressure or temperature, there is a Texaco steam cylinder oil to give you quiet operation and effective lubrication with low oil consumption. If your steam is re-used for processing, Texaco has oils specially developed to assure rapid separation from the exhaust.

To assist you in selecting the right oil for your particular steam conditions, Texaco Lubrication Engineering Service is available through more than 2300 Texaco distributing plants in the 48 States. Get in touch with the nearest one, or write:

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FOR THE PAPER INDUSTRY

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

Editorial

The Increasing Paper Consumption

▶▶▶ WHAT WE ARE interested in developing is "How great is the probable potential demand" and "potential consumption" of paper in the postwar period? "Then, what is being done about meeting that potential consumption?"

What are the authentic facts and where are the figures and scientifically determined research data covering postwar production and postwar consumption? So far as we can glean, they are nonexistent. The pulp and paper industry does not have them for the simple reason that they have provided no scientific setup to develop all of those demand and supply factors which are vital to the intelligent operation of the industry.

For instance—what authentic publicity do we possess as to the economic development of the Union of Soviet Socialist Republics? The public knows that country only as Russia, but Russia is no more.

The U.S.S.R. has come to stay. It is to become the outstanding economic competitor of the U. S. A. It is possible for the U.S.S.R. to outstrip the U.S.A. in economic, industrial and agricultural development within the next generation.

How many people know that in Moscow there is building the greatest skyscraper in the world—the Palace of the Soviets—seven times the mass of the Empire State Building in New York, and 115 feet higher—1,365 feet in all—surmounted by a statue of Lenin, 325 feet high. The Palace will house 40,000 people; it has 6,000 rooms; the amphitheater will seat 22,000, several thousand more than Madison Square Garden. It is the biggest building in the world.

That is the symbol to keep in mind. The U.S.S.R. is to be the biggest country in the world. In every way, it is emulating the successful progress of the U.S.A. In area, 8,819,791 square miles, the U.S.S.R. *is* the largest country in the world. It contains virtually every material natural resource of modern civilization—minerals of all kinds, basic and precious; every variety of timber except tropical; every character of cereal, vegetable and fruit lands. 3,124,360 square miles or 38 per cent of its area, is timber. Its lumber and pulpwood resources are the largest in the world. The population before World War II was 170,467,186, but after the creation of the Karelo-Finish, and the inclusion of Moldavian, Lithuanian, Estonian and Latvian Republics, the population increased to 192,695,710.

The incorporation of the Lithuanian, Latvian and Estonian Republics into the U.S.S.R. has not yet been recognized by the U.S.A. The economic future of the world is to be dominated by the U.S.S.R. and the U.S.A.

Now, the whole progress of the U.S.S.R. can be measured by its consumption of papers. It has embarked upon an immense plan of development involving huge expansion of industry, education, arts, and sciences. All of this active expansion is dependent upon liberal, constant supplies of paper because paper is the concomitant of all industrial, commercial, and educational activity. Without mass production of paper, mass production of commodities is impossible. Paper is power and paper power generates peace power. Paper is the prerequisite commodity to all planning, processing and progress.

The U.S.S.R. has greater population and greater timber areas than the U.S.A., but its percapita consumption of paper before the War was but twelve pounds, whereas the U.S.A. had a per capita consumption of three hundred pounds. However, the per capita consumption of paper in U.S.S.R. is rising rapidly. It has been estimated to be now about forty pounds.

On the basis of the population of 192,695,710, that would call for 3,853,914 tons of paper. Have they got it?

	Tons
In 1937, the U.S.S.R. produced	924,000
Finland produced	2,415,999
Poland produced	191,000
Latvia produced	44,000
Estonia produced	95,000
Lithuania produced	76,000
Total in 1945 U.S.S.R. control	3,745,000

The estimate of forty pounds per capita is a close approximation.

But, even if the U.S.S.R. does not at present consume the production in the areas credited to her control above, it will only be because its production processes have been damaged or destroyed by the war. At any rate, at least 1,784,000 tons of pulp and paper products exported by its countries in 1937, will not be available to prewar customers.

The net of the world's pulp and paper situation is that five woodpulp prewar exporting countries are out of the postwar export picture. In addition, the U.S.S.R. has become the most rapidly rising active consumer of paper in the world—second only to the U.S.A. at present The U.S.S.R. confidently faces an unlimited economic expansion because she possesses unlimited forest areas, whereas the U.S.A. faces limited, diminishing forest areas.

What's the answer? Who knows whether these trends, these premises and facts, be true? The pulp and paper industry should underwrite the establishment of a modern scientific institute for the determination of all those facts, for the benefit of its constituent mills, customers and the ultimate consumers of their products. Not only are we interested in the development and research for these scientific data, but the people of the U.S.A. are dependent upon them. The paper industry must supply them.

What Does This Mean?

The above emblem is far more than a symbol, a trade-mark or a credential. It is a badge of the highest honor that can be conferred upon its subjects by any nation.

The Army, the Navy, and the Rehabilitation and Reemployment Administration feel it is important that the people of this country become familiar with the emblem shown above—the shining gold eagle.

Every citizen should know that it is the Honorable Discharge Emblem awarded to veterans of the present war. The men who will wear this emblem have won a place in the Hall of Patriots. They have stood against the enemies of all that is right, good, and holy in this world. They have offered that which, if sacrificed, is all they have—they have offered themselves.

Some 13,000,000 men and women of these United States will wear this Honorable Service Emblem.

Current Thought

The Soldier and His Daughter

▶▶▶ From the personnel of an office I know intimately, one of the men is now a staff sergeant, hard at work in the Far East. He is a married man, with two children, the eldest of which is ten, and a student of a school in one of Chicago's northside suburbs. In a recent letter to me, the sergeant said:

"The motivating impulse for this letter is to pass on to you the 'Thoughts on V-E Day' written by the children in Carolyn's fifth grade classroom.

"Possibly my parental pride has something to do with assuming this to be of general interest, but I believe there is a good deal more to it than that. It's exceptionally well written, but it isn't that of which I'm thinking. Beneath the poetry of expression, there is a surprising awareness of the realities of war and peace. Compare this to the catechism of Nazi ideology or Shintoism. Seeing the destruction being wrought in the world today . . . 6-ton bombs, rocket projectiles, flame throwers, robot bombs, constantly increasing fire power and destructive force . . . reading of Germany's plans for a radio-directed rocket with a range of 3,000 miles; bigger planes, bigger bomb loads, secret weapons . . . knowing the progressively destructive steps that the years and wars have always taken . . . there is plenty of cause for wonder as to what unearthly mess of suffering, grief and unhappiness we are leaving our kids heir to. But, if our little people who are growing up so fast today can have thoughts like that, there is hope for the world, and all of us."

And now for the composition prepared by these fifth-grade tots.

Its amazing peneration will give you pause, hope, and encouragement. I take pleasure in quoting:

"We know who won this war:

"It was the Commander in Chief who made the big plans, . . . And the war worker who made the wing of a plane.

"It was General Arnold who had the men and supplies. . . . And the little things the little people did to sabotage in a small land like Denmark.

"It was General Marshall when he planned where the soldiers should fight, . . . And it was Jim and Jack and John and Bill who did the fighting.

"It was MacArthur and his army working together in the Pacific, . . . And the boy who ran across the bridge over the Rhine and broke the wires.

"It was General Patton who was racing through Germany with his army, . . . And two men driving a truck in a war plant at home.

"It was Bob Hope and his kind who helped keep up the soldier's morale, . . . And my cousin, when he sold his car because he knew the war needed gas . . . And the average man who didn't have tires for his car because the B-29's needed the rubber for their tires.

"It was Mary who built the gun on that airplane that flew over Japan and helped blow up one of their largest war plants.

"It was the home front buying bonds to buy the ships and the guns, . . . And the children collecting paper.

"It was all the little people in the little lands all over the world, . . . And their courage, and their braveness and their brains.

"It was our brothers and our sisters, our fathers and our mothers and all of us.

"After the war we want peace. . . . Peace is hard to get and hard to hold. . . . Peace is difficult to start after years of war.

"Peace is gentle. . . . Like spring flowers, or a mother's hand, or a stream of clear water . . . Like a soft snow that covers all the earth, . . . Like new, green blades of grass, . . . Like soft winds blowing where there is no war, giving no heartaches, . . . Like summer, which gives hurt to no person.

"Peace is delicate, . . . Like petals of a flower that can be blown about by the wind, . . . Like clouds in the sky that can be blown away, . . . Like a thin piece of string that can be easily broken, . . . Like glass that breaks when it is carelessly dropped, . . . Like a baby that cannot take harshness.

"Peace is friendly with all people, to all mankind. . . . Like your best friend who does not hurt you, . . . Like two puppies that play together, . . . Or two people who like each other; . . . Like two branches stretching out to the whole world, . . . Or like the rain that goes down into the earth and makes all things grow.

"Peace is like a cloud with the wind blowing it around, but it cannot be blown away. . . . It is like a tree; when it is chopped down, it dies, but it grows again from the roots.

"Peace is glorious to all that desire it. . . . It is victorious because men have a feeling that they helped make it.

"Peace grows like a little flower, not showing its tiny green leaves yet. . . . The little flower of peace grows from the help of its country feeding it. . . . And by the help of the whole world.

"The tiny flower does not know how to grow unless the people give it power. . . . The little peace flower only grows where the people give it time and don't bother it. . . . If people bother the tiny flower, it might easily be broken.

"We have made Victory and peace . . . Now we have to work with other people to keep them.

"In the years to come, I must help to keep the peace.

"I must use my intelligence wisely and have faith in what I believe is right.

"I must use my intelligence in my school, in my home, in other people's homes and everywhere I can.

"I will need my health so I can be physically fit to serve my country.

"I can work in the gym and in games and in everything that makes me strong, so I can help make the world better.

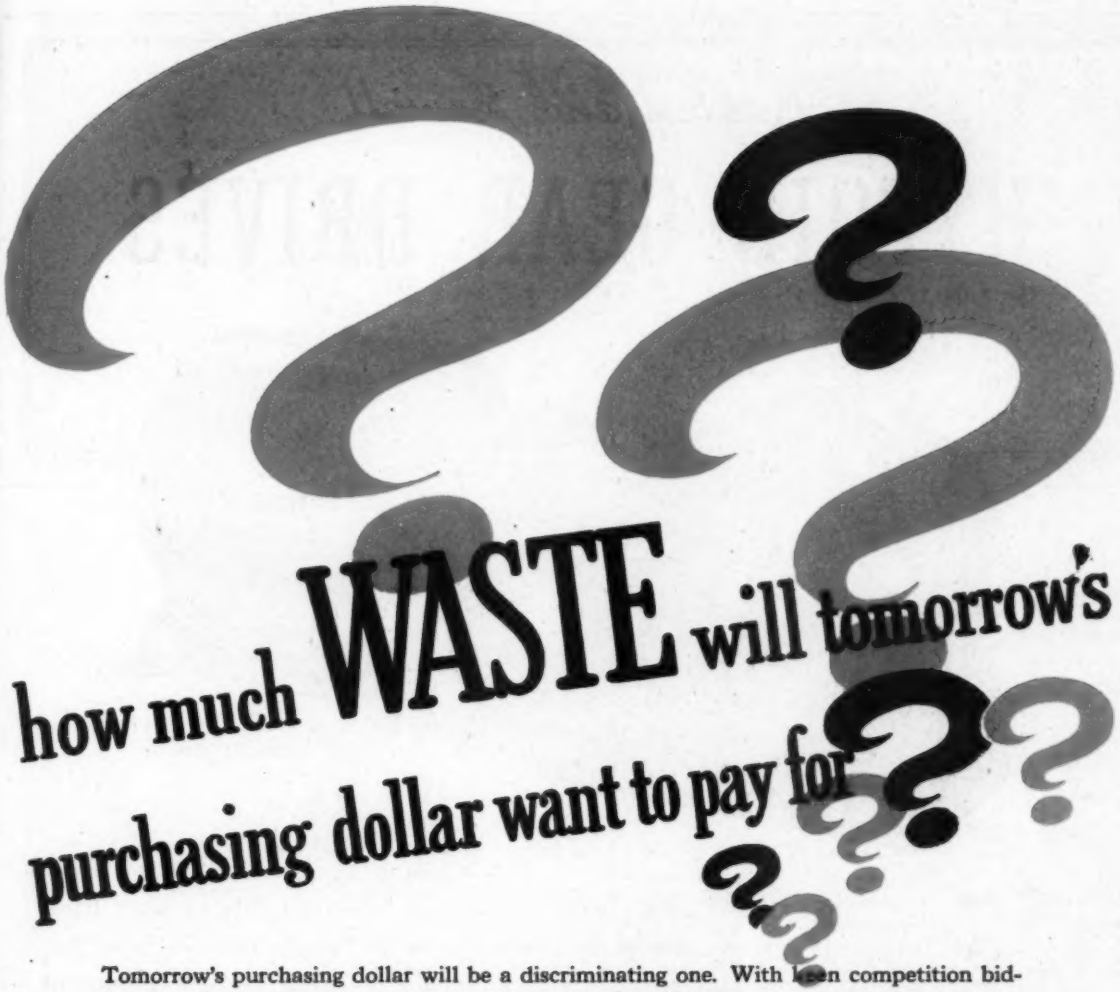
"I must use my mind so that if I ever have to attend a meeting I will be fit to work and guide people to a better world.

"I will learn all I can while I am still young, so when I grow older I will not have to hunt knowledge.

"I must learn to think for myself, so I can have a place in the plans for the world.

"But if we all work together with our best planning and thinking, each one of us will have a place with a world of powerful people—All working for peace. . . . And for the rebuilding of all the destruction of the war."

If only we, who are long past the fifth grade, could see things so clearly, there need be small fear for the future of the world.



how much WASTE will tomorrow's purchasing dollar want to pay for??

Tomorrow's purchasing dollar will be a discriminating one. With keen competition bidding for it—the purchasing dollar will be attracted only by definite and obvious value. The manufacturer, who hopes that he can dilute his product value with wasteful production methods and then expect his customer to pay for it, is an optimist who will please no one but his competitor.

Realistic manufacturers will allow no such loopholes in their selling of the future. They are planning efficient production methods with the thoroughness of a military campaign. Material handling and conveying equipment—the mechanical movement of materials *within* industry—offers them a wide area for cost reduction.

They plan for *tomorrow*—by consulting a Link-Belt material handling engineer *today*.

Link-Belt Conveyors are built to fit your **individual needs** — flight conveyors — overhead trolley conveyors—belt conveyors, Bulk-Flo conveyors, screw conveyors, chain conveyors and bucket carriers of all types—in fact, every type of conveyor for every individual need.

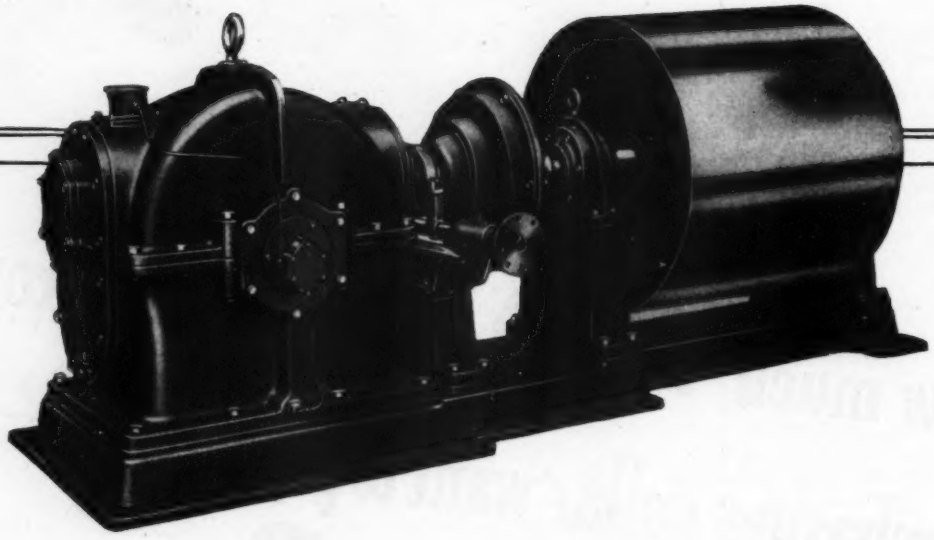
LINK-BELT COMPANY Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in principal cities.

MATERIALS HANDLING AND CONVEYOR EQUIPMENT

Engineered, Built and Backed by LINK-BELT

Bagley and Sewall

HYPOID GEAR DRIVES



★

★

ECONOMICAL

EFFICIENT

DEPENDABLE

★

★

MODERN types of enclosed, all-metal driving units have become so universally accepted by progressive mills that serious consideration should be given to replacement of old type drives.

The design and construction of these modern units provide for extremely low maintenance cost, and make possible a steadier running paper machine. Accurately cut Spiral Bevel or Hypoid gears, mounted on shafts supported by anti-friction bearings, deliver a steady, positive power with a minimum of power loss due to friction and improperly operating gears.

Detailed information regarding these modern driving units is available upon request.

BAGLEY B&S SEWALL

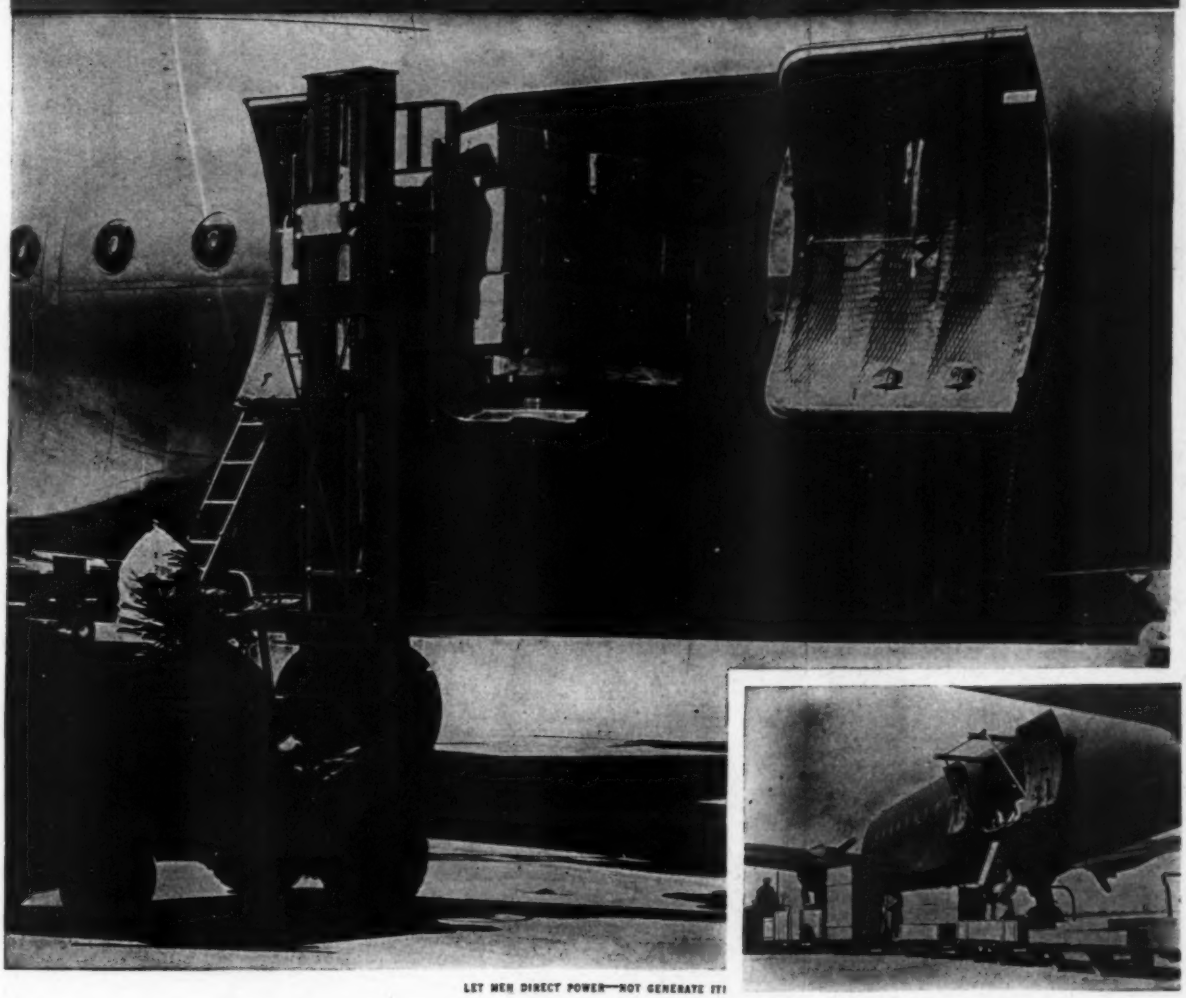
THE BAGLEY & SEWALL COMPANY

Builders of Paper Making Machines

WATERTOWN, NEW YORK

HANDLING+Processing+HANDLING+Assembling+HANDLING+Packing+HANDLING+Storage+HANDLING

HANDLING—the Common Denominator of PRODUCTION



LET MEN DIRECT POWER—NOT GENERATE IT!

Effective Distribution, the final phase of the production cycle, is predicated upon a good handling system. Distribution is concerned only with the finished product, representing the total cost of production, and is the end towards which all production efficiency is directed.

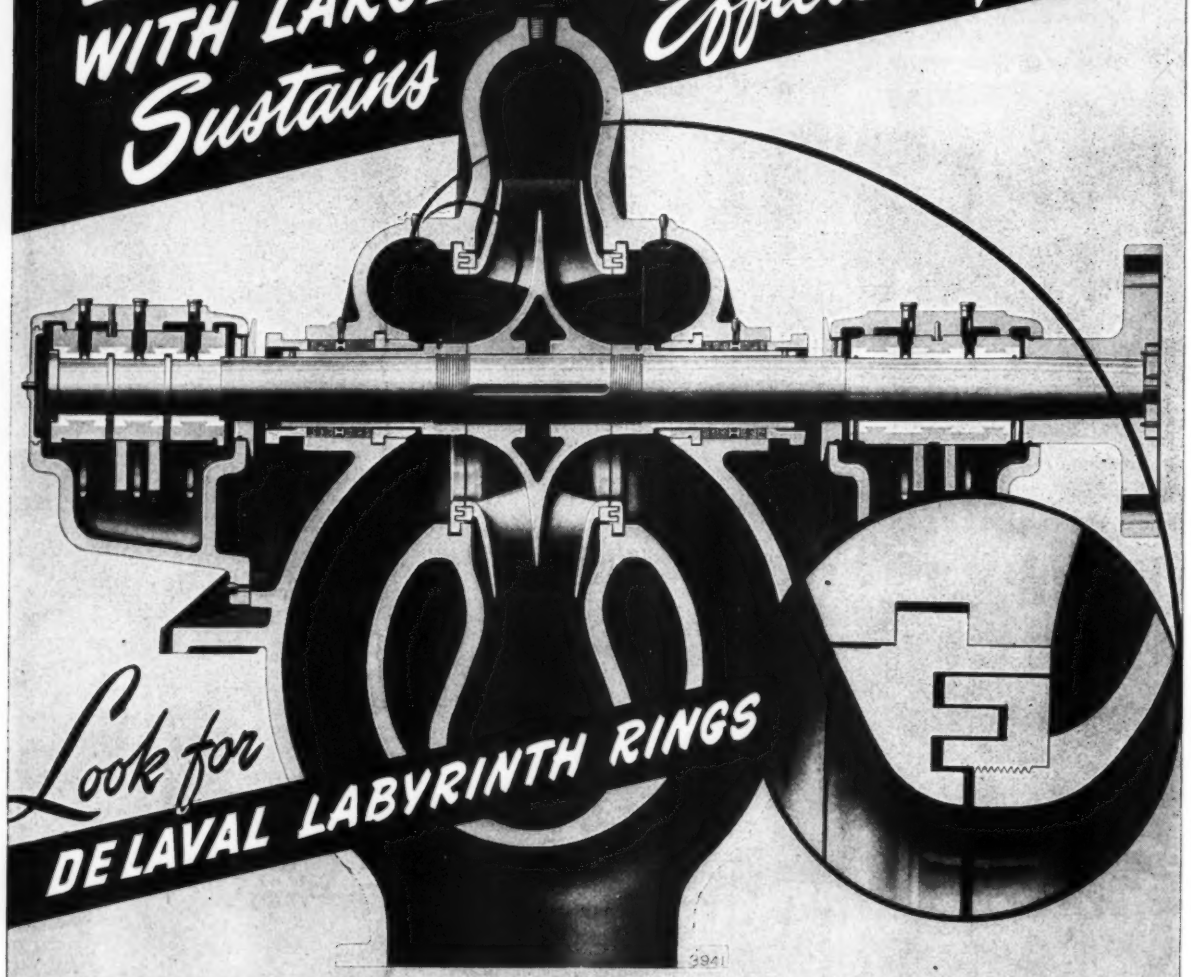
Flexible Towmotor, *the-one-man-gang,* provides an effective aid to distribution that enables you to derive the full benefits of well-planned production. The Towmotor Material Handling Analysis Guide tells you how to develop a well-planned handling system. Write for your copy.

TOWMOTOR

THE ONE-MAN-GANG

TOWMOTOR CORPORATION • 1220 E. 152ND STREET, CLEVELAND 10, OHIO

LESS LEAKAGE WITH LARGER CLEARANCES Sustains Efficiency



Look for DE LAVAL LABYRINTH RINGS

De Laval Labyrinth Wearing Rings contribute in a large measure to sustaining the high efficiency of De Laval pumps. The large clearance, tortuous labyrinth passage reduces leakage to a minimum and maintains ample running clearances under all conditions.

For sustained efficiency and reduced maintenance costs look for De Laval Labyrinth Wearing Rings when buying centrifugal pumps.

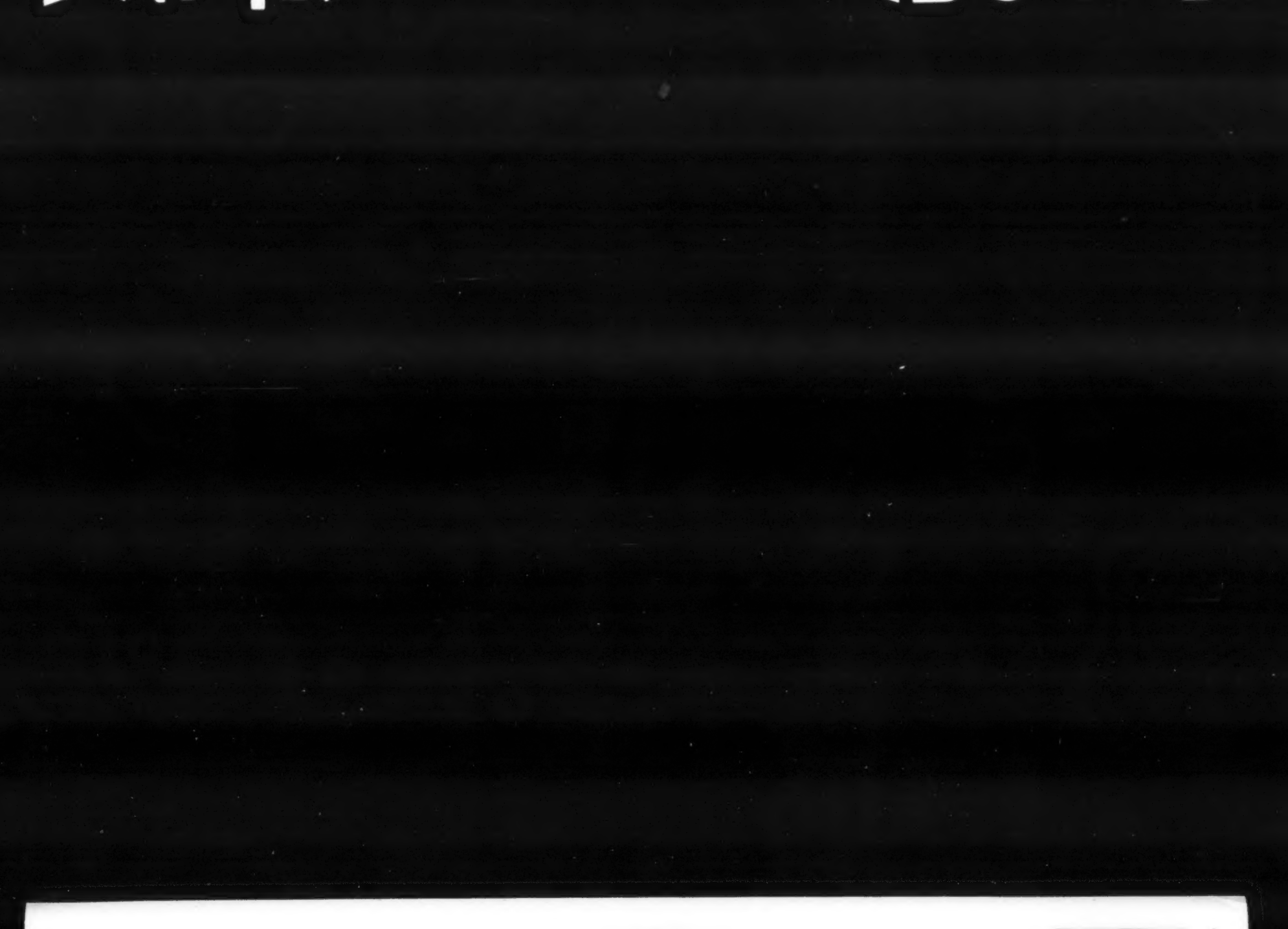
3235

TURBINES • HELICAL GEARS • WORM GEAR SPEED REDUCERS CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS and COMPRESSORS • IMO OIL PUMPS

DE LAVAL

STEAM TURBINE COMPANY · TRENTON 2, NEW JERSEY

SALES OFFICES: ATLANTA • BOSTON • CHARLOTTE • CHICAGO • CLEVELAND • DENVER DETROIT • DULUTH • EDMONTON • GREAT FALLS • HAVANA • HELENA • HOUSTON KANSAS CITY • LOS ANGELES • MONTREAL NEW ORLEANS • NEW YORK • PHILADELPHIA PITTSBURGH • ROCHESTER • ST. PAUL • SALT LAKE CITY • SAN FRANCISCO • SEATTLE TORONTO • TULSA • VANCOUVER • WASHINGTON, D. C. • WINNIPEG



Ever Try Giving Sharks the Brush-Off?

That's the job the Naval Research Laboratory asked Calco to "bear a hand on"...and that Calco pitched in and helped do.

It involved more than you'd think—this problem of equipping personnel operating over warm waters with some simple, sure-fire way of keeping sharks off. And yet, thanks to

the combined efforts of Naval Research and Calco, the answer proved as simple as it was effective: a tiny brick of water-soluble wax permeated with a special dye that blackens the water...and keeps sharks at bay. It was Calco that developed...and helped manufacture...that special dye.

Why do we mention this to the trade? Not to pat ourselves on the back—*but to pat you on the back*. We mean, for the understanding you've shown when we've turned aside from supplying you as completely as we'd like...

in order to devise and supply materials that help save lives and win wars.

Meanwhile, you may be sure of this: we're doing everything in our power to meet your present requirements—with all the time, labor and effort we can muster.

Heller & Merz Department

CALCO CHEMICAL DIVISION • AMERICAN CYANAMID COMPANY

Bound Brook, New Jersey

New York • Chicago • Philadelphia • Boston • Charlotte • Providence

POINTED RHYMES FOR TRYING TIMES

by
Berton Braley

Here is wisdom by the peck
Versified to save your neck!

DON'T BLOW IT

Oh, workman or scholar,
Hang on to your dollar
And do not spend it soon,
For every cent
Unwisely spent
Inflates the price balloon.

IT MAKES SCENTS

To market (black market) to spend lots of jack
Careless of how many ceilings you crack,
To market (black market) where prices are dear,
—Gosh, there's a terrible smell around here.

If

If you can keep your head and calmly ponder
How silly spending drives the prices high;
If you can save the cash you'd like to squander
And only buy the things you need to buy;
If you can do your part to fight inflation
By simply being thrifty with your pelf,
You'll do a vital service to the nation
And—furthermore—you'll benefit yourself.

Bonds you buy with payroll earnings,
Help fulfill your future yearnings.

NO GAMBLE

When the war is over, will the prices
rise or fall?
We do not know the answer, and
nobody does, at all.
But this much we *can* prophesy—
whichever way they go:
You will find it more convenient if
you've saved a little dough.

★ ★ ★

Money in your pocket,
Take it out and sock it
Into War Bonds, which
Help to make you rich.

DOUBLE AND NO QUITS

When you boost your paycheck quota and allot it
To another bond—it's pretty soft for you!
For, although you've spent your money—you
have got it,
And the Interest is interesting too.

WHO? ME?

There was a little dope with a fat
pay envelope
And she spent every cent that
was in it.
And she wondered, by-and-by,
why the prices rose so high,
But she didn't blame herself for
a minute.

★ ★ ★

INFLATIONARY MARY

Inflationary Mary spills
This silly kind of chatter:
"My little teeny-wee bills
And spendings do not matter.

"And if I cheat a little bit
On rationing and ceilings
The Nation's welfare isn't hit
By my small lawless dealings!"

Inflationary Mary's wrong.
For she'd be much to blame
If people in a mighty throng
Should say and do the same.

Small spendings, in the aggregate,
Reach sums extraordinary,
So let's not try to imitate
Inflationary Mary.

★ ★ ★

ADVERTISERS, PUBLISHERS—NOTE:

You are welcome to use all or any part of the material on this page to aid the fight against inflation.

SNAKE IN THE GAS

There was a crooked man and he
lived in crooked style,
He dealt at crooked markets with a
smugly crooked smile.
He viewed himself as clever with
his crooked ration book,
But everybody knew him for a
crooked little crook.

★ ★ ★

THE GANG'S ALL HERE

You may ask, "Why should *my* spending
Cause inflationary trending
Though I squander every penny I have got?"
—If you're joined by sixty millions
Of civilians blowing billions,
You'll discover that it matters quite a lot!

YOU CAN LAY TO THAT

As the best egg for a nest-egg
Buy a War Bond—buy a batch.
But you gotta keep 'em settin'
Or they ain'ta gonta hatch!

Save your pay
Here's a way—
Bonds and savings and insurance
Give your future more endurance.
Mrs., Mister,
Brother, Sister,
Don't compete in buying things
That is whence inflation springs.

ONE PERSON CAN START IT!

You give inflation a boost

—when you buy anything you can do without
—when you buy above ceiling or without giving up stamps (Black Market!)
—when you ask more money for your services or the goods you sell.

SAVE YOUR MONEY. Buy and hold all the War Bonds you can afford—to pay for the war and protect your own future. Keep up your insurance.

A United States War message prepared by the War Advertising Council; approved by the Office of War Information; and contributed by this magazine in cooperation with the Magazine Publishers of America.

How WELDCO Tubing and Fittings REDUCE COSTS

Weldco tubing meets a special need. It saves money in many applications for many companies.

Weldco tubing is made on unique equipment which permits a very wide range of diameters with choice of wall thickness at reasonable cost. Low setup charges permit economical production of Weldco tubing in odd lots or in carloads. Tubing can be made of carbon steel or of any weldable corrosion resisting metal. Hence, Weldco tubing stimulates cost-saving practices.

For example, you may require large diameter tubing but pressures are low, hence, you do not need a heavy wall. You can buy Weldco tubing with light wall and save the costs of many tons of metal. If you want heavier walls, Weldco can give you that, too.

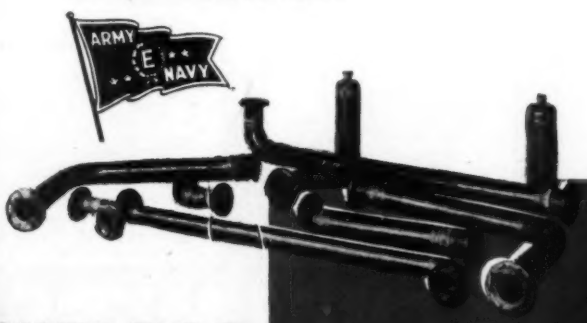
Corrosion is alway expensive! Weldco tubing, available in any weldable material, can be made for you to meet any corrosion problem. It will meet your requirements not only for corrosion resistance but also for pressure and uniformity. Corrosion resisting tubing will save in many ways.

Whether your needs be for standard or odd sizes, in large or small quantities, of carbon steel or special metal, you will find it well worth your while to consider Weldco.

Write for Literature

FITTINGS

A complete line of Weldco fittings is available in the same material and wall thickness as the tubing. A well-equipped plant with an experienced engineering department places The Youngstown Welding & Engineering Company in position to design and fabricate the entire pipe assembly you require.



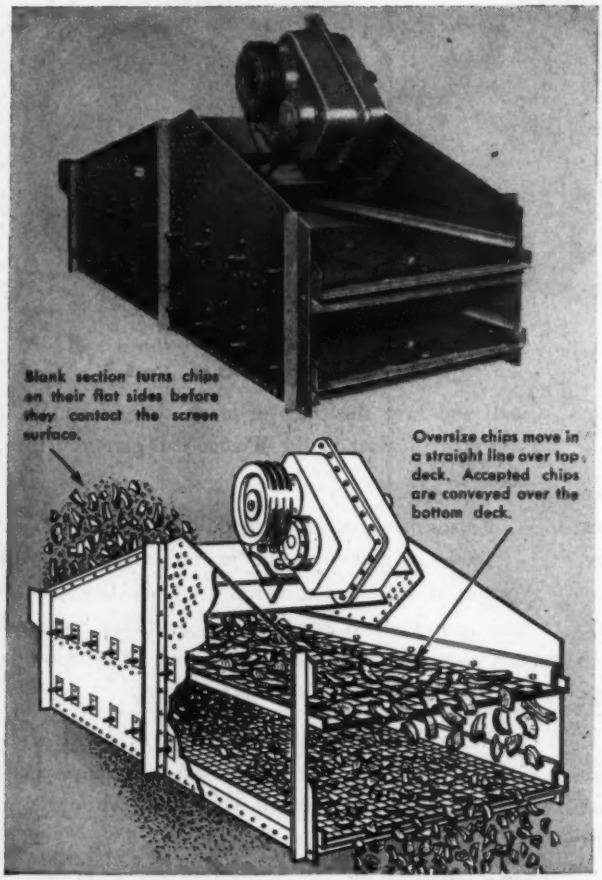
Working pressure data, in pounds per square inch for Weldco tubing in some of the popular sizes and materials

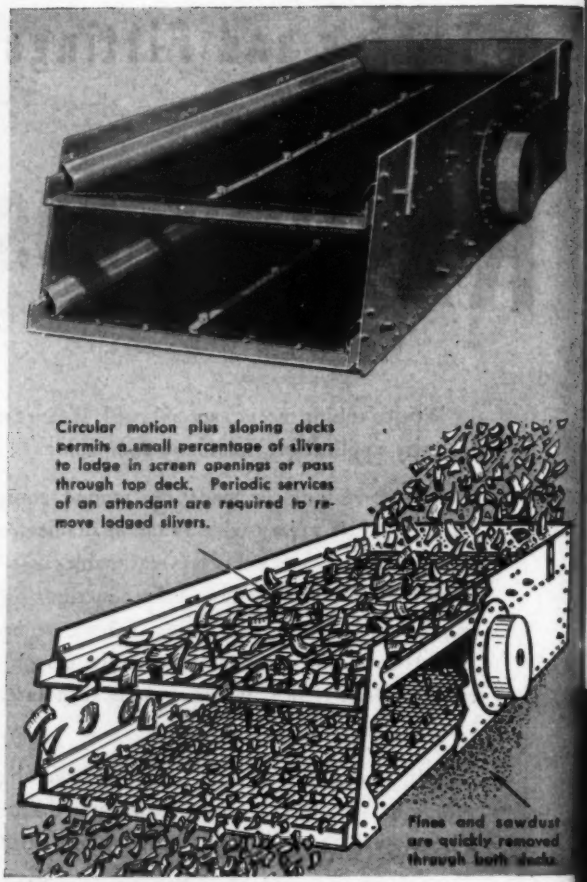
O. D.	Wall	Cuprо Nickel	Monel	A Nickel	Inconel	Type 316 Stainless	SAE 1020 Steel
3½	.083	530	880	740	980	880	690
4	.095	540	900	750	1000	900	700
4½	.109	550	920	760	1020	920	710
5	.120	540	900	750	1000	900	700
5⅝	.134	540	900	750	1000	900	700
6⅛	.156	530	890	740	990	890	690
7⅛	.180	530	890	740	990	890	690
8⅛	.203	525	880	730	980	880	680
9⅛	.238	535	900	750	990	895	690
10¾	.259	540	910	755	1010	910	700

THE YOUNGSTOWN WELDING & ENGINEERING COMPANY
3752 Oakwood Ave. • Youngstown, Ohio

WELDCO *Specialists in Corrosion Resistance*

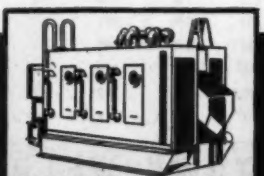
Which Chip Screen is


Blank section turns chips on their flat sides before they contact the screen surface.
Oversize chips move in a straight line over top deck. Accepted chips are conveyed over the bottom deck.

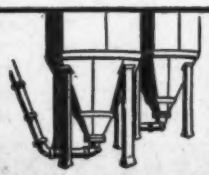

Circular motion plus sloping decks permits a small percentage of slivers to lodge in screen openings or pass through top deck. Periodic services of an attendant are required to remove lodged slivers.
Fines and sawdust are quickly removed through both decks.

1 THE LOW-HEAD CHIP SCREEN with its *horizontal* decks and 45° straight-line motion gives you the *highest percentage of uniform size chips.* Reason is that all chips are carried in a straight line — *on their sides*—with acceptable chips passing through, rejects and long slivers passing over, the top deck. Low-Head gives you *bigger capacity* than comparable size inclined screens, and *saves manpower* — practically eliminates need for attendant to remove slivers!

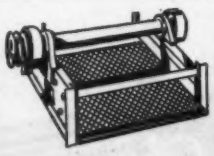
2 THE RIPL-FLO CHIP SCREEN with its 25° *inclined* decks and circular motion gives you an *average percentage of uniform size chips.* For many grades of pulp, Ripl-Flo is a good buy . . . for 3 principal reasons: 1) It does as good or better screening job than *any* inclined screen; 2) It is *lower in initial cost* than most comparable size screens; 3) Has *only 2 bearings* — takes less power, less maintenance than conventional 4-bearing screens!



PREPARATION — Hydraulic Barkers, Chip Screens, Saws, Slashers, Interplane Grinders.



COOKING — Digesters, Blow Tanks, Kilns, Slakers, Heat Exchangers, Condensers.



WET ROOM — vibrating-type screens for use as Thickeners, for dewatering rejects.

PAPER-MAKING — special design Drives for Paper Machines, Rewinders, Calenders.

ALLIS CHALMERS

Best for You?

That depends on your particular needs! At Allis-Chalmers you can select from 2 different Screens—each designed to size a different quality of chips!

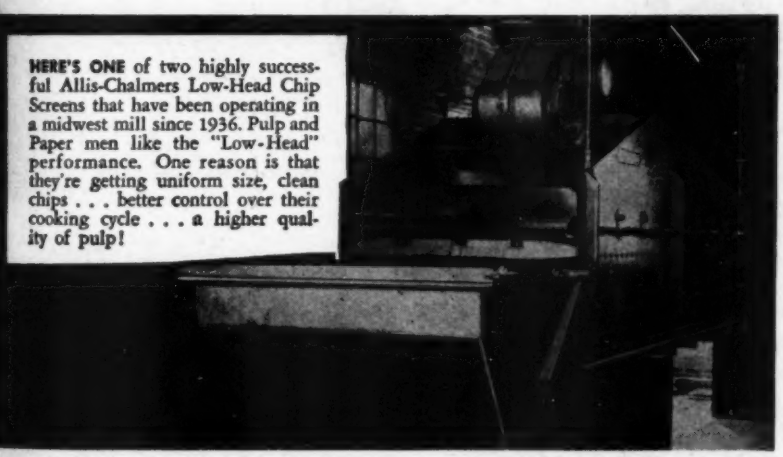
ALTHOUGH most operators agree they'll eventually standardize on *Vibrating-type* Chip Screens, they *don't* agree that *all* such screens will give them comparable results.

For *correct* selection depends on the *individual* mill . . . is based on such factors as: quality of pulp to be produced; type of chippers; available manpower, etc.

That's the reason A-C offers you 2 different types of vibrating Chip Screens . . . wants to know the *complete facts* about *your* particular operation before it makes a recommendation to you!

For helpful, preliminary information on selection and application of Chip Screens, send for Bulletin B6353. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.

A 1851



HERE'S ONE of two highly successful Allis-Chalmers Low-Head Chip Screens that have been operating in a midwest mill since 1936. Pulp and Paper men like the "Low-Head" performance. One reason is that they're getting uniform size, clean chips . . . better control over their cooking cycle . . . a higher quality of pulp!

BULLETIN!

HOW TO TAKE A RECONVERSION INVENTORY of your Centrifugal Pumps, Motors, V-Belt Drives — is subject of A-C's newest help to U. S. industry!

Now being offered *free* to all interested individuals in the Pulp and Paper industry, is a *complete Reconversion Inventory Kit* consisting of — *fact sheets* and *check lists*, together with suggestions for inventory procedure.

SEND FOR THESE FREE HELPS TODAY!

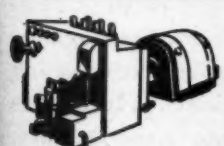
THE NEED. As equipment becomes more widely available, and as you reconvert toward peacetime production, you may be faced with an unprecedented problem of inventory-taking.

You may have to determine, *more quickly* than such a job has ever been done before, the EXACT CONDITION *of every piece of equipment* you propose to use in peacetime production.

For about 4 years, far greater emphasis has been placed on setting production records than on keeping maintenance records. Condition of equipment is often unknown. And because, during wartime, much equipment has been worked 3 and 4 times as many hours a year as in peacetime, even calendar age may mean nothing.

STANDARDS HAVE BEEN SET UP — which apply to *all* makes of equipment — not just A-C's. The Reconversion Kit offers you *standards* which will help you determine which of your units are: (1) okay as is; (2) need new parts; (3) will shortly require replacement; (4) need immediate replacement; (5) need reapplication; (6) are obsolete; or (7) may have parts of second-choice materials dictated by wartime shortages.

GET YOUR FREE KIT NOW! For your supply of Reconversion Inventory aids, covering Pumps, Motors and Drives, call your nearby A-C district office or distributor, or write direct to ALLIS-CHALMERS, MILWAUKEE.



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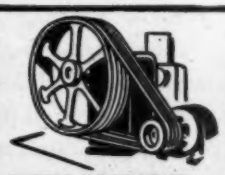

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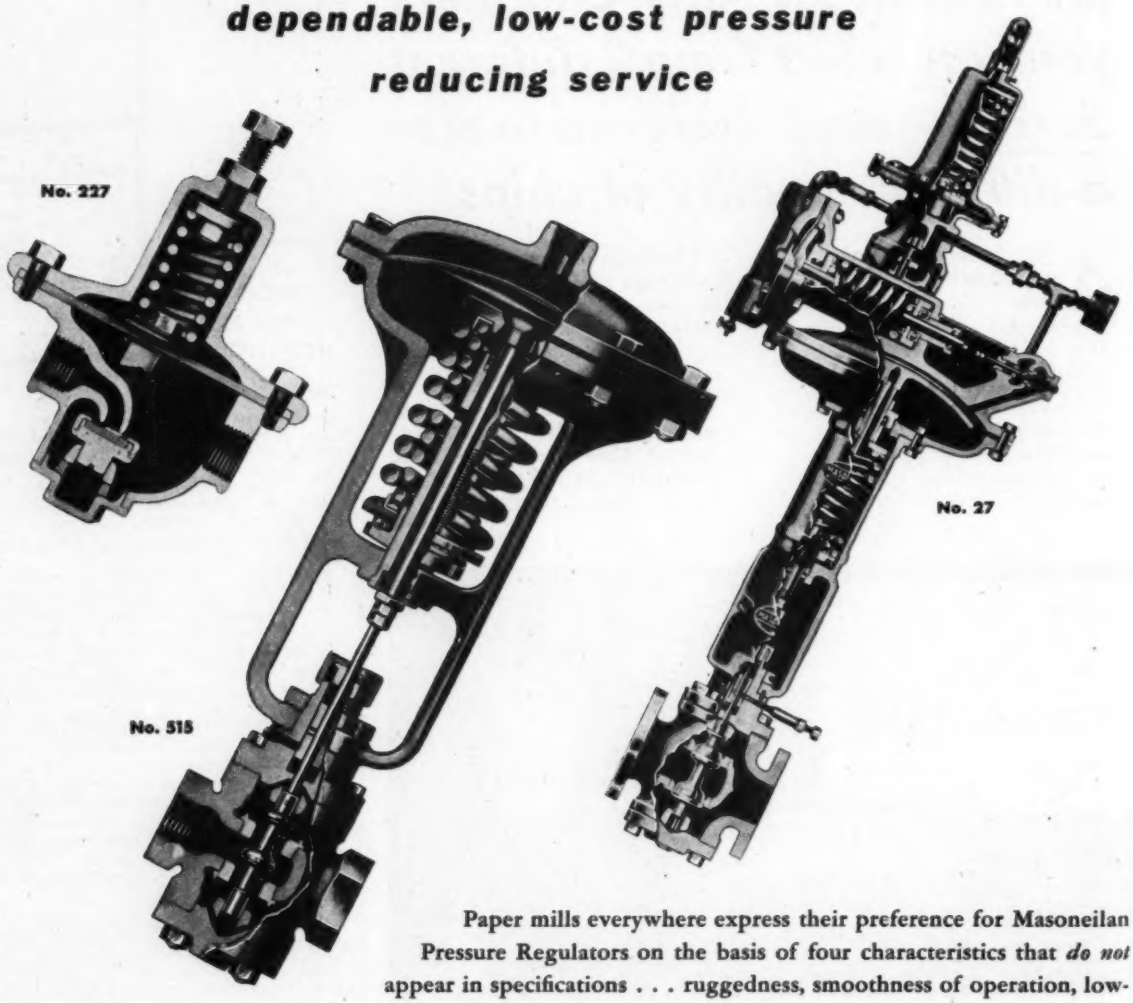
Speed up paper production with accurate, dependable, low-cost pressure reducing service



Paper mills everywhere express their preference for Masoneilan Pressure Regulators on the basis of four characteristics that *do not* appear in specifications . . . ruggedness, smoothness of operation, low-maintenance and low-operating costs. No matter what your pressure reducing service requirements . . . steam, water or air . . . you too, can save money by installing Masoneilan Regulators. Their accurate operation, ease of adjustment, and long-lived performance will reduce waste and minimize production delays due to time out for servicing . . . Investigate Masoneilan Pressure Regulators. Write for Catalogs 72 and 73, today.

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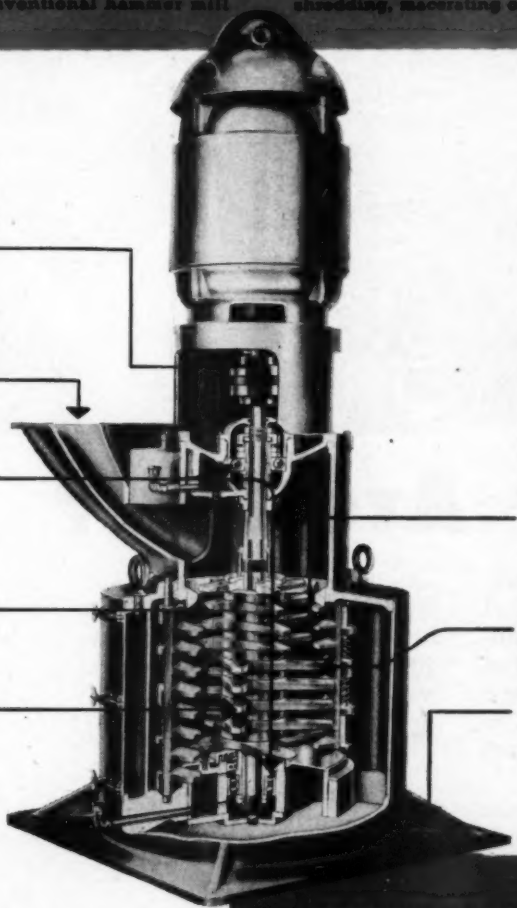
No other mill gives you *ALL* the outstanding advantages of the new

ENTERPRISE Vertical Mill

Naturally, you can do more effective work in a *vertical* position than you can in a horizontal position and so can a grinding mill. The New Enterprise Vertical Mill is essentially the conventional hammer mill stood on end...a design offering you many benefits obtainable in no other way. There is an Enterprise Vertical Mill to meet your specific needs of grinding, shredding, macerating or pulping.



Less power loss...less operating noise because motor is direct-connected without gears or belts. *Belts and gears in horizontal mills usually are noisy, result in lost power.*

Less labor because vertical construction permits down feed and down discharge. *Horizontal mills require excessive handling of materials.*

Longer operating life because fully lubricated bearings are in moisture and dust-proof housings.

Uniform quality of grind assured by even distribution of material around rotor. *In horizontal mills, smaller discharge area usually results in material "bunching."*

Faster maintenance because hammers are changed in minutes... not hours!

More effective work, free from vibration, because the mill grinds for full revolution of rotor. *In horizontal mills, only one-half of each revolution works. Result: Vibration, less work.*

Longer hammer life because even wear on rotors maintains perfect balance. *In horizontal mills, uneven wear on rotors results in unbalanced operation, shortened hammer life.*

Quick change of grind fineness because inexpensive screens are easily changed. *Horizontal mills usually require extensive alteration to produce different finenesses of grind.*

Fast complete grinding at slower speeds because full revolution of rotor is utilized. *Ordinary mills, running at the same speed, work only half as fast.*

Less floor space needed because of vertical design. *Horizontal mill requires large floor area in plant.*

WRITE FOR THE NAME OF YOUR NEAREST DEALER

for complete information on the many types of rotors and accessory equipment available.

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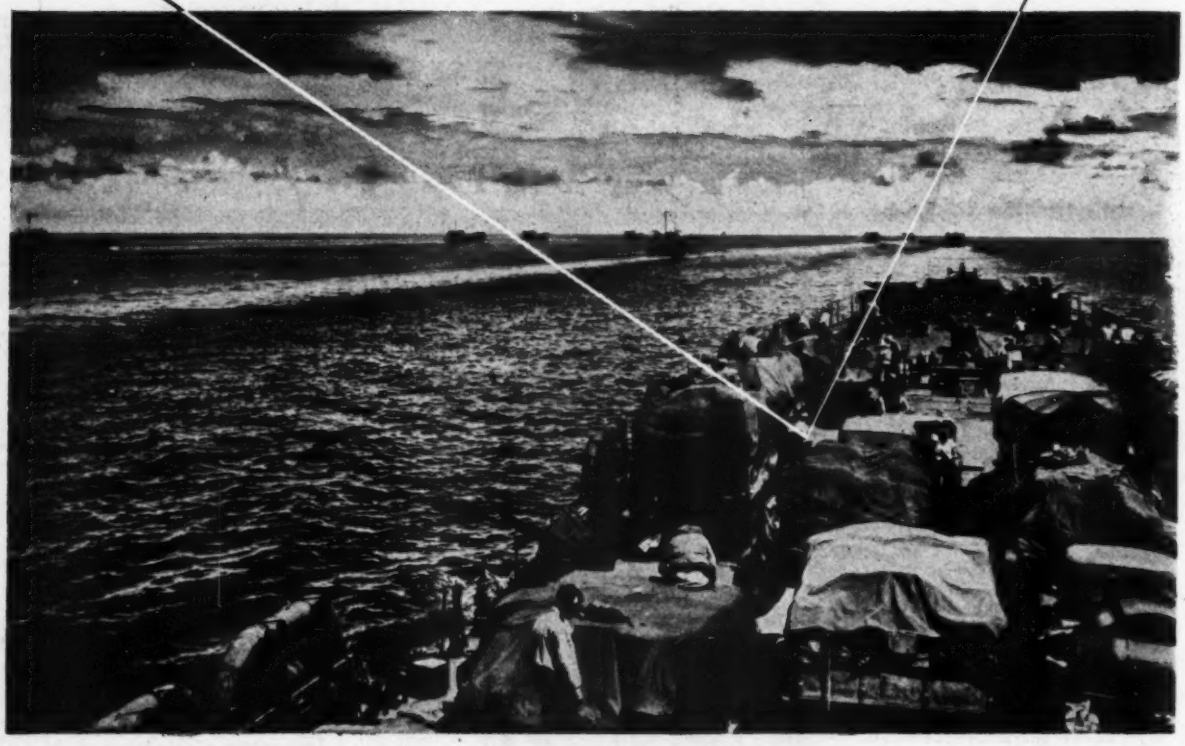


Are You?

Today the veterans of our European victories are sailing to final triumph in the Pacific! Meanwhile patriotic American industrial leaders are following a full-speed-ahead program to hasten peace through the Payroll Savings Plan!

From coast to coast, veteran Bond salesmen—and women—who put over the Mighty 7th, are once more mustered into service for plantwide selective resolicitation campaigns. These special efforts to keep employee Bond buying at a maximum are directed toward two major objectives:

A To hold every new 7th War Loan subscriber on the Payroll Savings Plan books—maintaining and, wherever possible, increasing present Bond allotments.

B To convince all regular subscribers who recently stepped up their Bond buying, of the many advantages of continuing on this foresighted, extra-Bonds-for-the-future basis.

Back up our fighting men who have won one war—and will win another. Use selective resolicitation to make your Payroll Savings Plan more effective—put a tighter rein on inflationary tendencies—build peacetime prosperity.

The Treasury Department acknowledges with appreciation the publication of this message by

The Paper Industry and Paper World

★ *This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and War Advertising Council* ★

Industrial LOGISTICS*

Needed in the Paper Industry

2 first-class examples illustrated— the E-P Man will aid in finding others in your Mill or Plant

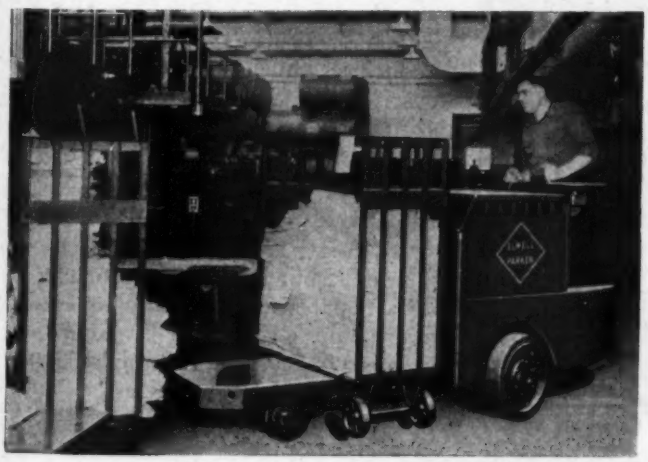
To Mill Men "all materials" includes:— **1**—everything that may be purchased for Paper Manufacturing **2**—all the loads moving through the Mill **3**—finished stock to warehouse, railway car or highway truck.

To Converters or Printers "all materials" means **1**—incoming Mill Products **2**—stock through process **3**—finished goods to the customer.

Elwell-Parker invites you to search *your* Load-Transportation Cycle for sources of important new savings and profits—to call on the E-P Paper-Handling Consultant for co-operation in *finding* them. No obligation.

The Elwell-Parker Electric Company, 4241 St. Clair Avenue, Cleveland 14, Ohio.

**The science of transporting all of your Paper Plant materials faster, without waste, in Master Unit Loads, on Pallets or Skids, by Elwell-Parker Electric Trucks, Tractors and Cranes.*



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ELWELL-PARKER

POWER INDUSTRIAL TRUCKS

Established 1893

Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 8 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS

Map copyright by L. D. Post, Inc., New York. American Map Co., N. Y.

HIGH LIGHTS:

When William Bradford, first printer of Philadelphia and partner in the paper mill established by Rittenhouse in 1690, moved to New York, he made, with his former partner, the first paper contract on record. As his business flourished he reached out to New Jersey for additional supplies to a paper mill known to have been in existence in the 1720s, but of unknown origin, although the first in this State.

According to Week's history of Paper Manufacturing, Bradford is said to have bought this mill in 1728 to supply his newspaper, *The New York Gazette*, established three years earlier. So little has been recorded of papermaking in New Jersey that it is a challenge to further research.

Nevertheless, New Jersey ranks seventh among the States in the production of paper and paperboard, producing annually about 780,000 tons, with an emphasis on paperboard. The latter fact is significant in view of the increasing ratio of paperboard production to that of paper.

New Jersey has 41 paper mills, no pulp mills, but is a large consumer of waste paper for re-use in place of virgin pulps. There are 20 Fourdriniers, 50 cylinder machines, 3 Yankees and 15 wet machines.

Draper Felts for Efficiency

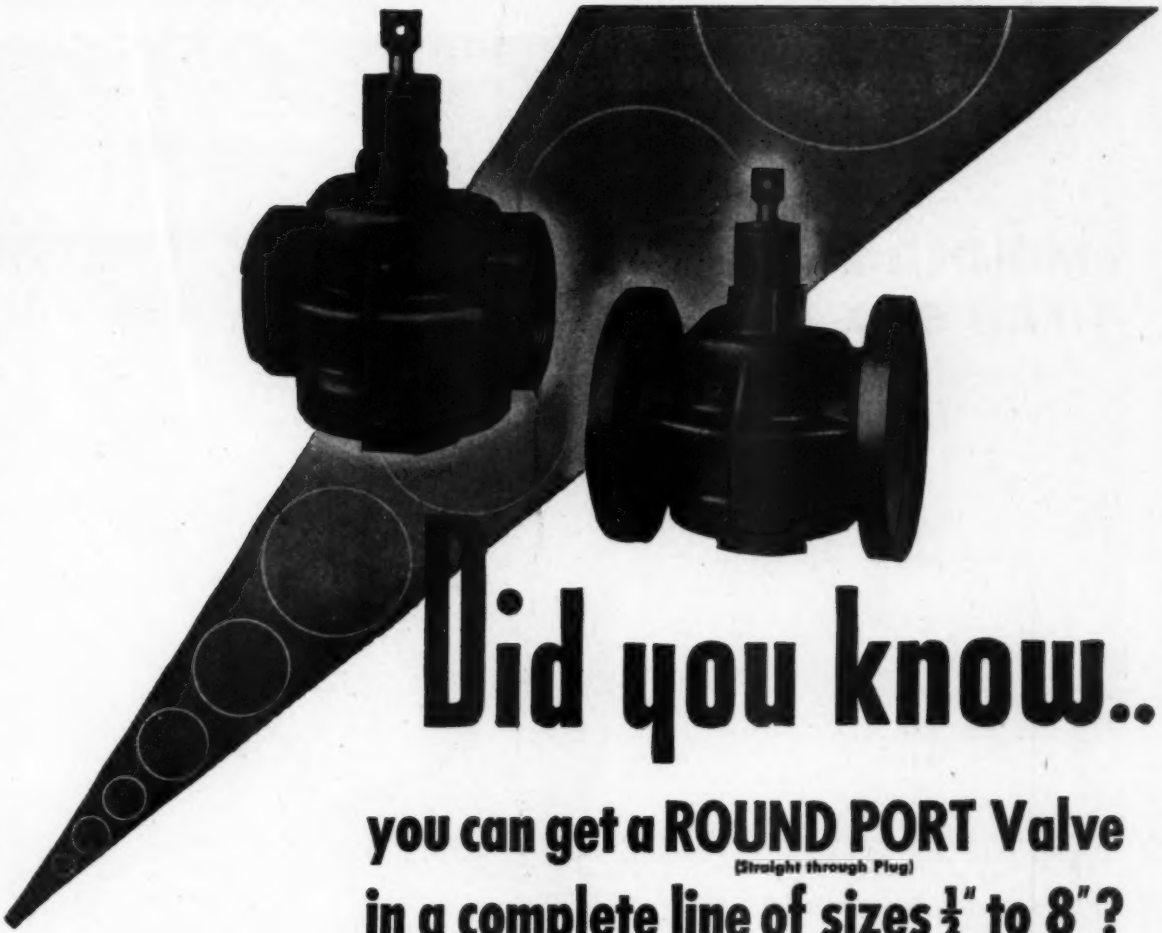
DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

Canton, Massachusetts

RALPH E. BRIGGS Sales Manager

BRADFORD WEST PITTSFIELD, MASS. • WILLIAM N. CONNOR Jr CANTON, MASS. • L. H. BREYFOGLE KALAMAZOO, MICH. • CHAS. E. BERTSCHY MILWAUKEE, WIS. • W. L. CAMPBELL SAVANNAH, GA. • BALFOUR GUTHRIE & CO. Ltd. PACIFIC COAST



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you can get a ROUND PORT Valve (Straight through Plug) in a complete line of sizes ½" to 8"?

IF your pipe line comes within the above range of sizes — there's an O.C.F. ROUND PORT Full Pipe-Area Lubricated Plug Valve to service efficiently the most difficult ladings. When open the O.C.F. ROUND PORT becomes *an exact continuation of the pipe.* There is *no change* in velocity, area, direction or cross-section of the lading.

Constant flow velocity, constant form and direction of the flow stream minimize energy losses, prevent increased friction or abrasion at the valve — add to valve life. A specialty in our line of full pipe-area lubricated plug valves, the O.C.F. ROUND PORT is designed precisely for regulating the flow of heavy fluids and ladings. There are no pockets to trap sludge, tar, grouting, asphalt, viscose, rayon, nylon, granular solids, paints, varnishes, etc.

The O.C.F. ROUND PORT Lubricated Plug Valve needs only a minimum amount of lubricant for the initial charge and for servicing. No auxiliary packing is necessary — for the lubricant acts as a plastic head gasket. If desired, go-devils, swabs or other cleaning agents may be utilized — or the valve may be dismantled quickly and re-assembled as easily. The O.C.F. ROUND PORT lends itself to installation in any position, thus simplifying the design problem in new and replacement work. No special tools are required either for installation or operation and the valve's compactness is a definite advantage where space is limited. Can be supplied in wrench, spur or worm gear types.

Representatives in principal cities carry adequate warehouse stock for quick delivery. Send for Catalog #3-P.

Quick Facts for Chemical Petroleum and Plant Engineers

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Full Unrestricted Pipe-Area Port Openings reduce pumping costs — also speed up handling of ladings. Specify O.C.F. Round Port Valves on your next installation.

AMERICAN CAR AND FOUNDRY COMPANY
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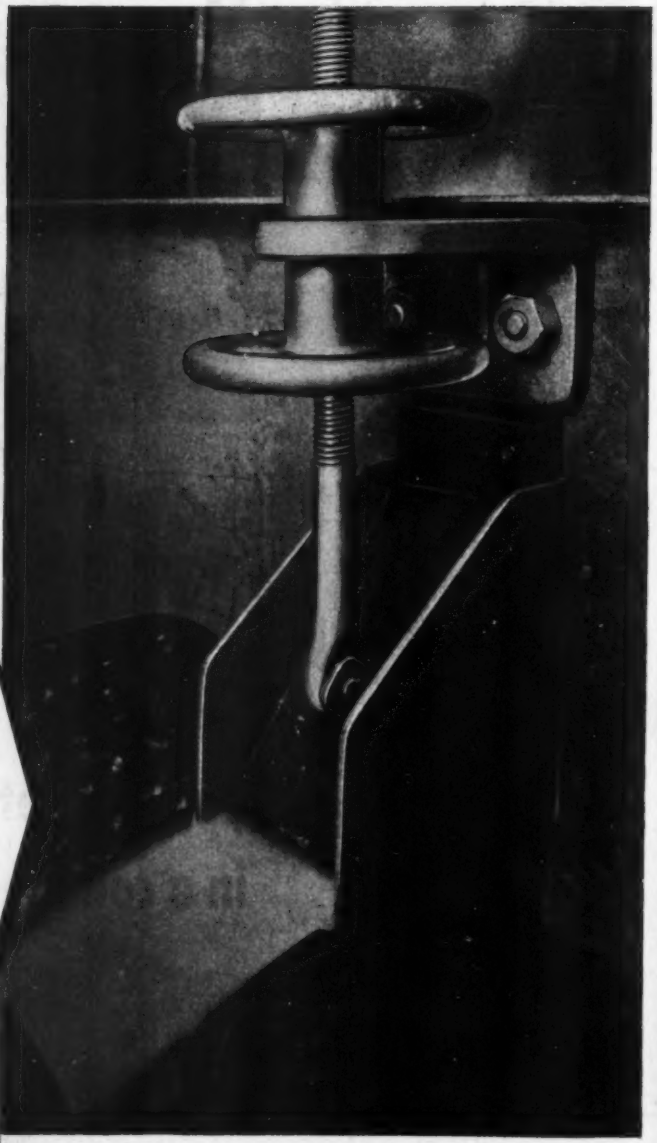
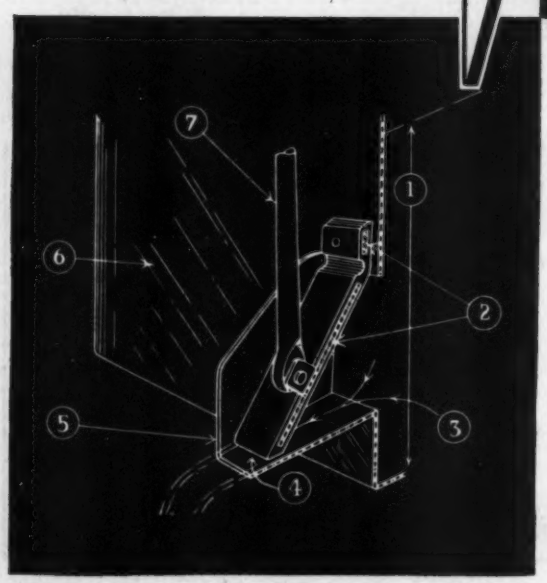
SHARTLE MOLDED RUBBER HEAD BOX GATE

Hundreds in Service and Doing Good Job



FEATURES

1. Fixed head maintains constant spouting velocity.
2. Metal inserts molded in resilient rubber.
3. No obstruction in stream flow.
4. Flow can be metered to close tolerances or closed entirely.
5. Die-formed stainless steel lip.
6. Readily washed up from both inside and outside . . . no lodgements.
7. Stainless steel adjusting rod.



The Shartle molded rubber head box gate exhibited at 1940 convention, has now been through the "fire" of mill service for five years and certainly has proved its worth.

If you want a close control, self-cleaning and non-clogging gate at reasonable cost, the Shartle is your gate.

Further particulars to interested mills.

SHARTLE BROTHERS MACHINE CO.

Middletown, Ohio.

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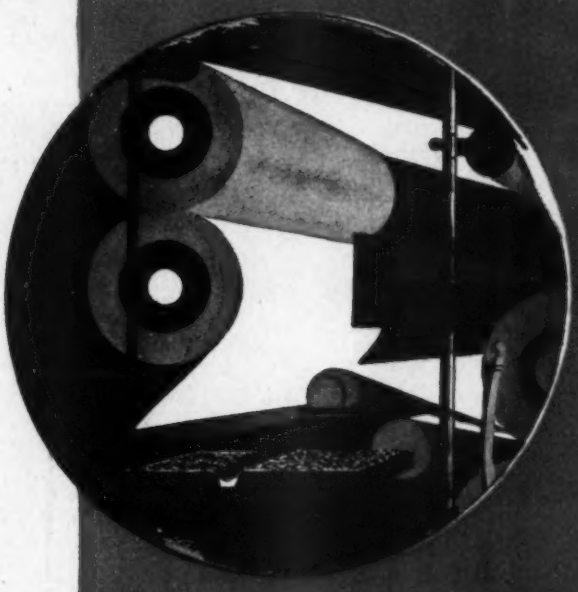
ONE OF 27 DOW CHEMICALS USED BY THE PULP AND PAPER INDUSTRY

mold is generally all wet!



HOW DOW FIGHTS MOLD ATTACKS

Water—indispensable to man—nevertheless causes many manufacturing headaches. Under certain conditions, it encourages the growth of mold—destructive mold that constantly harasses production in many industries.

In one step of paper making, for example, the wet pulp mass that eventually becomes finished paper is carried on felt belts and squeezed partially dry between rollers. Being subjected to constant dampness, the felt is up against continual mold attack.

Dow research men tackled the problem and came up with Dowicide—a germicide and fungicide that increases wet felt life as much as forty to sixty per cent. Paper manufacturing has benefited immeasurably.

Furthermore, Dowicide products have helped paper producers combat other mold attacks . . . they have aided in slime control, in preserving log and pulp stock, in making packaging papers mold resistant, in reducing maintenance costs.

Similar mold problems in the textile, lumber, paint, and other industries are being successfully reduced by a Dowicide specifically designed for the job. If you are bothered by molds, fungi, bacteria, or termites, write us to find out how Dowicide can help you.

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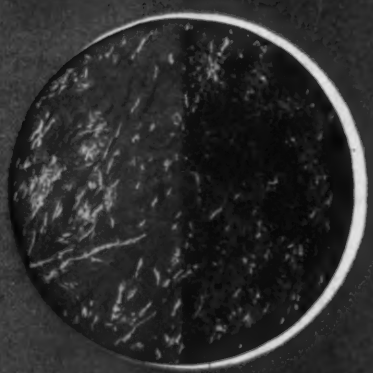

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Germicides and fungicides

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

S-212 SPURS
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Here's Why!
This new and better attachment for every type of Jeffrey P-W Chain offers these advantages:
1. Stronger because made of all-formed, one-piece steel, ¾" thick.
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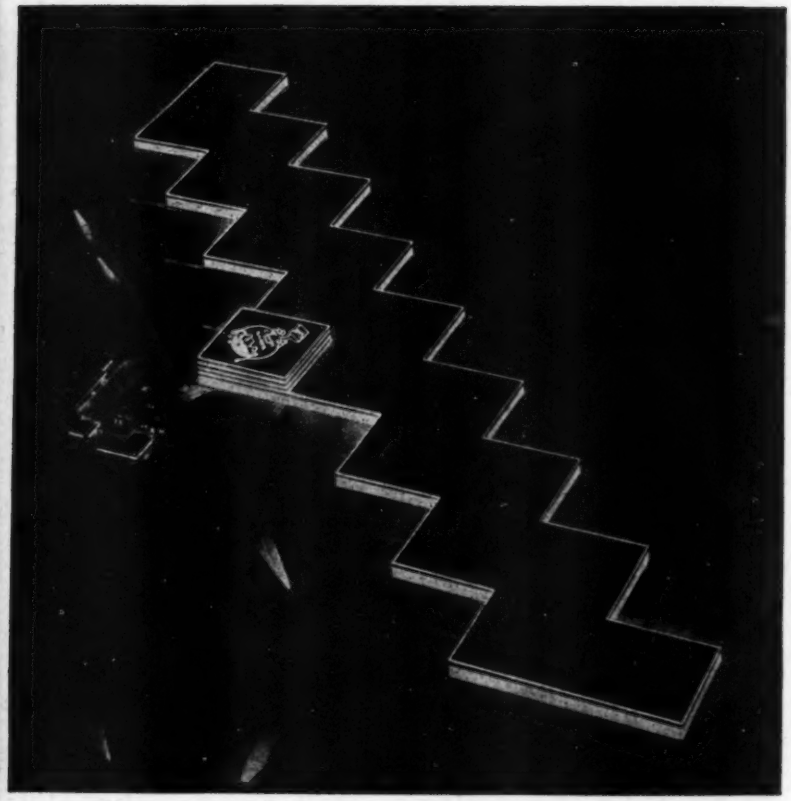


GEORGE W. DODGE
The H. K. Ferguson Company

Illustrated is an air view of one artist's conception of The Factory of the Future, on which subject a research study was carried on by leading members of The H. K. Ferguson Company, of Cleveland and New York. The increasing importance of air travel is brought out in this design of The Factory of the Future (cf. "The Paper Industry and Paper World," July, 1944.)

Planning that New Mill or Additions to Old

▶▶▶ IN CONSIDERING the field of engineering and construction as applied to the manufacture of pulp and paper, it is well to note that this industry ranks high in the first ten great industries of the country (including agriculture). Since expansion and growth are expected in practically all major industries, it is a foregone conclusion that the pulp and paper industry will follow this trend in the postwar period.

The volume of business, expressed in tons sold, has been increasing consistently due to a systematized, economic, and intelligent utilization of raw material, reclaimed waste material, the ingenious development of paper products, substitutes for existing products and research in the field of by-products recoverable from the chemical processes used. The demand now existing for the volume of paper products available is created by the users of these products, and these same consumers are very receptive to new lines of goods when made of paper and wood fiber. Generally, products made of wood fiber and chemical pulp show a decided lower price range than that of their competitive line, as for example: roofing paper vs. wood shingles, fiber board vs. lath and plaster, container board vs. wood containers, paper towels and paper napkins vs. linen and cotton. With this as a positive influence and combined with American resourcefulness and ingenuity, it is currently only a matter of available manpower, plant capacity, and equipment, to further definitely extend the line of pulp and paper products.

American exports, which are anticipated as postwar business, will consume appreciable tonnage of heavy grades, and the foreign market may represent a potential consumption of kraft for bags and containers, twine, and fabrics.

The general inventory of finished paper and paper products is now well below the normal for the Industry.

The demand for chemical and mechanical pulps is greater than the present mill capacities to which must be added the demand for these products by the manufacture of fabrics and plastics.

The American pulp and paper industry, in anticipation of an increased demand, has been forehanded in that

it has already placed orders for equipment in sufficient volume to provide a backlog of orders in several of the larger machine builders' plants, covering at least one and possibly two years plant capacity, and it is to be noted that the foreign market is showing much interest in American paper and pulp mill machinery.

A recent report of the Federal Reserve Bank shows graphically the paper and pulp tonnage growth by districts, and it would appear that an appreciable postwar tonnage would be required to meet the curtailment of expansion shown during the past two years. The greater portion of this expansion may be expected to be developed in the Southern States because the supply of wood in this section is adequate and is, or may be, made adaptable to all grades of brown and white papers. Topographically, this area has other economic advantages, such as power, fuel, and low construction costs, which result in a lower over-all cost product.

Among other potential possibilities is the use of Russian imported wood for consumption in our northern mills. If this wood were barked by American methods, it would be a source of raw material supply adequate for a large increase in tonnage of higher grade papers and pulp. We have the ships, can furnish the equipment, and Russians the labor, and in a democratic way afford our Ally a chance to trade out their obligations, if such there are.

If such additional tonnage is developed in the Southern States, each development will probably necessitate the building of a town-site and considerable housing facilities, much the same as was required in the Canadian districts. This phase of any new plant project is a most important item, because it is quite essential that the operations be provided with suitable social and domestic surroundings, and since most locations are established by such factors as wood supply and haulage distances, it is obvious that a plant may not always be located in the environment of a large existing community.

The general housing situation at the moment is suffering from a scarcity of medium to low cost houses. Undoubtedly a postwar program will include a large volume of this class of structure, and thereby stimulate the demand for liner paper, wall board, insulation, and roofing, hard board, and many other grades of pulp and paper products.

Since construction and building area is only a space, foundation and coverage for certain equipment, the volume of this is dependent upon the amount and capacity of the new equipment being installed, and this amount is in turn dependent upon the consumers' demands for pulp and paper products.

If any value may be assigned to the governing factors outlined herein, it would seem that there should be a material increase in construction of plants for additional capacity in the principal grades, including kraft, bleached kraft, wall board, hard board, and chemical pulp, with a possibility of groundwood mills in the South using Russian wood in making of newsprint, G. W. specialty grades, and in combination with bleached kraft in white papers.

What the monetary value of such additional construction work would amount to is hard to forecast, but at the moment it would be only a guess to say $50,000,000 as a starter, and if hard board comes into more general use, as indications would seem to point, this figure might be doubled, and to which might be added $25,000,000 covering additions in northern mills, for white papers and specialty grades.

We must bear in mind also that with any such expansion there is as well some consumer expansion required to process and convert this additional tonnage, and since the Industry at large has been curtailed in this respect for several years, it is only to be expected that there will be a serious demand not only the current accumulated requirements, but such anticipated addition and expansion as are indicated by the general return to normal operation in both domestic life and commercial activities and by the demands for grades which have not been obtainable during the war period.

As the end of the European conflict is an actuality, the time is at hand to lay the plans for such new work or additions to old, as the needs of the Industry indicate. Long deliveries of heavy equipment are still unfortunately the vogue. But it is fortunate that the requirements for such new work are customarily supplied by manufacturers who will not be required to reconvert their plants to meet the Industry's demands.

The major items required are of specialized design but a large volume of standard equqipment including electrical, steam, hydraulic, pipes, valves, and handling equipment is of standardized design and should be available within reasonable periods.

The projects as anticipated could be best developed by doing the engineering as required in advance—many companies are so doing—and work on construction could then begin and be well advanced by time of equipment delivery. Much better plannings and arrangement of flow and economics of installation and operation could be developed by adequate pre-planning. This is particularly true in providing for additions to an existing plant, which is usually much more difficult to design than a complete new mill.

Such engineers as are at present available generally are of a class having large experience in this field of work and capable of contributing their knowledge to the benefit of the project with a resultant entirely to the benefit of the owner.

Undoubtedly the construction field will be one of those which many of the present service men will prefer to join, and in many cases their experience will be an asset in the field. So it would be reasonable to expect an increase of personnel for field construction, at least there should be more available, which would allay one headache at least.

This same factor will relieve the equipment manufacturer, and with the release of critical materials, deliveries should improve. There may be a necessity to continue the use of priorities for a period covering the immediate orders, but, by anticipating the requirements, placing orders, and the vendors scheduling deliveries, a reasonable program will be established and deliveries made as orders are scheduled.

This indicates the necessity of preplanning, and much of this is in progress.

How much salvage material, building areas, and construction equipment will be available for use by construction companies or adaptable to the requirements of the pulp and paper industry, or building area, is a question, but probably few of the buildings available will be adaptable to this Industry. Some converters may find desirable building areas, but most pulp and paper companies require a highly specialized type of plant for the economic development of the process and proper installation of equipment.

If such salvage equipment were known to be available, then by careful planning much of the standardized type could be designed into the project, which is another reason for preplanning of the work contemplated.

Any salvage which can be affected by such efforts should be done, if only in a minor way, to offset in part, the necessary expenditures we have been obliged to make in recent years, and effect what economics are possible in any new work contemplated.

The industry in general is progressive as is indicated by the development of

(Concluded on page 718)

Animal Glue as a Paper Sizing and Coating Adhesive

H. B. SWEATT
National Ass'n of Glue Mfrs., Inc.

▶▶▶ ANIMAL GLUE, a product of animal hides or bones, has been in continuous use for various applications for the past 3,000 years. It has been used for the making of paper for many years previous to the first fabrication of paper by machine. In fact, glue has been used so long in the making of paper that it would be hard to imagine the paper industry without it.

Used during all of this time as a sizing material and much more recently as a coating adhesive, glue serves a variety of purposes.

Some papermakers add animal glue to the beater in conjunction with rosin size. Glue used in this way serves as a protective colloid and is particularly useful in combating local difficulties with hard water caused either by natural conditions or by the use of fillers containing carbonates. It also improves fine papers in which only comparatively small amounts of rosin sizing are used. In the latter case, the glue encourages the retention and dispersion of the rosin.

Hard finished boards and papers, as well as body stock for coating, also are improved by adding glue to the stock in the beater. Similarly animal glue is used in making papers of exceptional strength, such as kraft paper for gummed tape, thin tissues for cable insulating, spinning and twisting paper, etc. This practice eliminates surface fuzz without making the product brittle.

In addition to being used as a beater size, glue also is applied as a sizing to paper surfaces. This treatment, producing a protective film, improves the writing and printing qualities of the paper, prevents feathering or undue spreading of inks, enhances the resistance of the paper to tear, and increases both folding endurance and wet-rubbing resistance.

The process for applying glue to paper in this manner is designated as tub sizing, surface sizing, and top sizing.

The term tub sizing came into use in the early days of papermaking when handmade sheets were immersed in tubs of animal glue size or starch. Persisting to this day, the term is used interchangeably with surface sizing for designating the treatment accorded a continuous web of machine-made paper when drawn through a sizing solution.

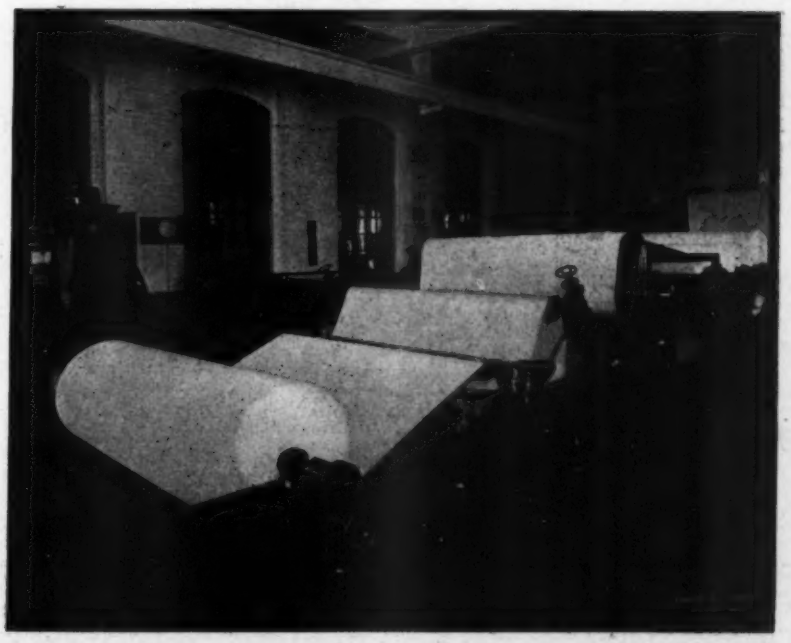
In the case of certain high-priced, rosin-sized papers, glue also is used as a surface sizing to impart greater resistance to rosin. When glue is used in this manner, it also may be referred to as top sizing.

Many sizing experiments have been conducted by paper manufacturers as well as by the United States Bureau of Standards to determine the best sizing materials or combination of materials to use. These tests show that glue sizing renders paper relatively non-absorbent and gives it a hard surface—the writing quality of which is superior to paper which has been only rosin sized. In addition, such tub sized papers exhibit more resistance to repeated erasures, also more firmness, snap or rattle—yet with sufficient resiliency that it is not tinny. The use of glue sizing alone for tub sizing, rather than mixtures of starch and animal glue, or starch alone, results in paper of greater strength and greater resistance to wear.

Some rag content bond and ledger papers as well as some sulphite bond and ledger papers are tub sized with glue. Certain photographic, blueprinting and other special papers similarly are tub sized. A recently expanding application is seen in the offset lithographic printing industry, where greater efficiency in production is traceable directly to the longer life which tub sized offset papers impart to the plates and blankets.

One of the best examples of the permanence of glue sized paper is paper money. The Bureau of Engraving and Printing of the United States Government specifies glue sizing for such paper because of the increased folding resistance as well as increased resistance to moisture, rubbing and cracking that glue sizing imparts to the paper.

Fine paper manufacturers have found that high grade glues or commercial gelatins are the most satisfactory glues or gelatins for surface sizing. These high grade products gel more readily, possess higher viscosity, and cause less darkening of the sized paper than similar products of lower quality. Then, too, they impart greater strength and wear resistance, as well as better writing qualities to the paper.



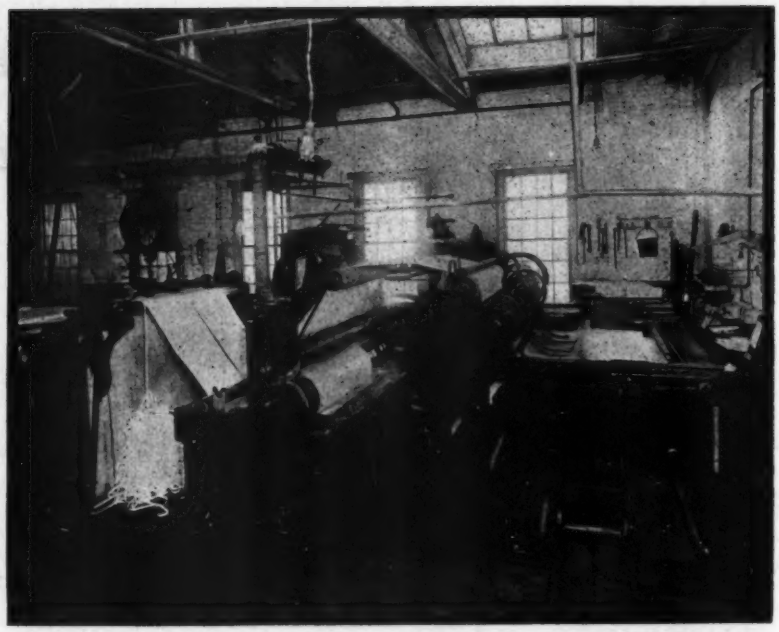
Finished paper being run through size tub, then passed through air dryer (Photo courtesy Nat'l Association of Glue Manufacturers, Inc.)

Since high grade glues are tougher than low grade glues, smaller amounts of a high grade glue are sufficient to impart a given increase in strength to a paper. Careful soaking and the maintenance at proper temperatures of solutions are important factors in the handling of high grade glues. Sloppy, careless handling tends to degrade them and to reduce their efficiency.

The bursting strength of a tub sized paper may be increased by increasing its glue content. This practice also tends to increase resistance to wet rubbing unless the surface of the paper is broken. Disintegration takes place at the point of the break if further rubbing takes place. However, if the glue is distributed uniformly, the sheet will effectively resist wet rubbing.

The folding endurance of a paper also may be controlled by the glue content. Experiments have shown that folding endurance increases in proportion to an increased glue content up to a certain point. After this point is reached, the addition of more glue progressively tends to decrease the folding endurance.

Whenever unusual folding endurance is required of paper, softening agents or lubricants should be used. Application of these materials may be made by spraying or by immersion in a bath. The most commonly used softeners are hygroscopic salts (such as calcium chloride and sodium or postassium acetate), glycerine or its substitutes, and nondrying oils. Whatever the softener used, expert knowledge and experience are necessary to insure best results.



Cutting and tub sizing of loft dried paper (Photo courtesy Nat'l Association of Glue Manufacturers, Inc.)

In preparing a size solution, an accurately measured quantity of glue is added to the correct amount of cold water and then allowed to soak for two hours. Longer soaking is inadvisable, especially in warm weather, for it encourages bacterial growth. To discourage such contamination, alum or other preservatives may be used.

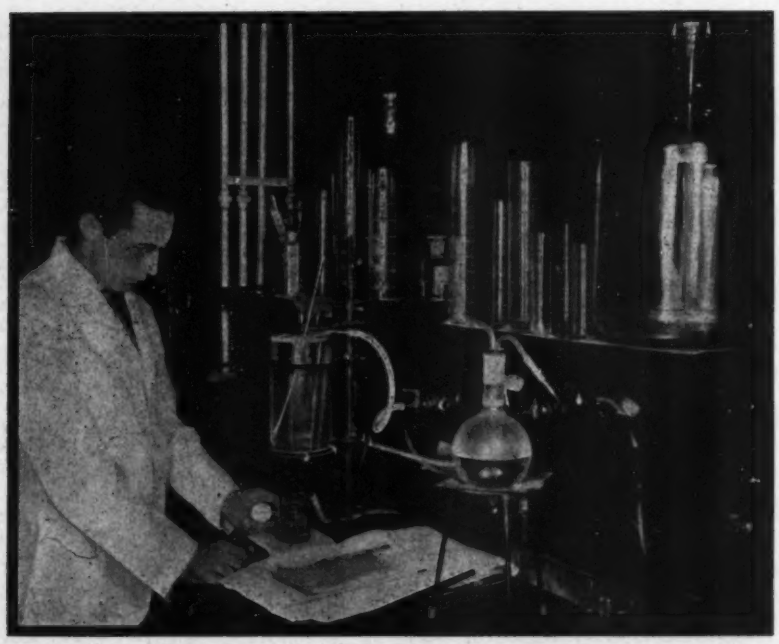
After the glue has swollen, the tempertaure of the batch is raised to 140 Fahr. During this heating operation, the glue goes into solution. Stirring helps to dissolve the glue; but, if air bubbles are to be avoided, it must be done carefully. Likewise, the temperature should be kept as low as possible once that the glue is thoroughly dissolved. Otherwise, overheating breaks down gel strength and viscosity, and encourages hydrolysis of the protein.

The conditions controlling the use of a glue size solution are determined by the individual mills. Both the distribution of the glue and the retention of the glue by a given paper depends on the fluidity of the solution and upon the length of time the paper is immersed in the solution. Controls are exercised by regulating the amount of paper in the bath at one time and by passing the web between pressure rolls immersed in the solution.

After the paper leaves the size tub, it is passed between squeeze rolls, set up over the tub, to remove excess size. The excess returns to the tub.

Another variable is the amount of water in the paper at the time it is subjected to sizing. Some mills permit as much as 15 per cent moisture; other mills cut it to as low as five per cent. Since too much moisture frequently causes excessive cockling of

(Concluded on page 718)



Making viscosity tests of animal glue (Photo courtesy Nat'l Association of Glue Manufacturers, Inc.)

British Paper Trade *in World War II*

EDITOR'S NOTE: A foreign correspondent (who prefers to remain anonymous) has contributed this résumé including late developments in the British Paper Trade.

▶▶▶ PROFITING BY THE experience gained during the previous war, the Paper Trade, like many other British industries, was not taken unawares when World War II was declared. On September 1, 1939, a small body of men, representing the chief sections of the Trade, moved into the Great Western Hotel at Reading, Berkshire, where they remained throughout the war years (augmented by additional staff as the need arose). This small body represented the Paper Control, under the direction of the Ministry of Supply. Although occasional efforts were made to bring the Control back to London, during the lulls in the aerial bombardments, these were unsuccessful. Reading, being within easy reach of the capital (45 minutes by train), proved to be a happy choice for it was just outside the principal area of enemy activity but sufficiently near not to cause serious inconvenience to the members of the Trade. The constant stream of inquirers and visitors was sufficient proof of this.

The Control was headed by A. Ralph Reed (later Sir Ralph Reed, of the A. E. Reed Company, group of mills) whose lifelong experience in the paper trade proved invaluable. He brought to his intricate and difficult task an impartiality of judgment and an equality of treatment which received constant praise from every trade section.

That the Controller and his small band of initial helpers had not been idle during the previous months was proved immediately for on the day prior to the declaration of war, the Trade members suddenly discovered that the Control of Paper No. 1 Order had been published. This document, running to nearly 40 pages demy 8vo, proved to be extremely comprehensive and covered practically every quality of paper and board manufactured, together with the innumerable extras coincident with making and finishing. In effect this order placed a rigid hand on the trade; its obvious purpose being to introduce a steadying influence, in order to stop panic buying, and to create a sense of confidence during the early unsettling days of transition from peace to war. The Order was divided into two parts; the first converting production, and the second merchanting. These two parts governed the maximum selling prices from producer to merchant and from merchant to converter. (No attempt was made to interfere with retail prices.) As these prices, in the main, were those ruling immediately prior to hostilities it can be appreciated that this Order cut the ground from the prospective profiteer. Any chances of making easy money and thus taking advantage of the country's state of emergency were destroyed. In the same Order the prices of the principal papermaking materials; wood pulp, wastepaper, and rags were also controlled.

A government publication is not everybody's choice and the contents of this Order needed careful study, especially as it was written in that quaint phraseology, dear to government departments which is totally unfamiliar to the business world. However, when shorn of its frills, the various paragraphs gradually emerged into a statement that all the usual stock lines and makings were to continue to be sold at their prewar prices and special makings could not be sold above the highest prices charged during the previous three months. This latter also applied to special makings for new customers who if not satisfied with the prices demanded could request the seller to "produce for inspection by the first mentioned purchaser the entries in the books or accounts kept by the seller relating to the sale to the other purchaser." Certainly a startling innovation in business methods wherein a seller's books could be inspected by a buyer, but we know of no case where the second purchaser exercised his rights. Holders of paper or papermaking materials were also obliged to furnish particulars of their stocks and finally the order did not interfere with existing contracts.

We have dealt with this order at some length for we feel that its importance, the power it had over the trade, and the effect it had during those first few days of war should be appreciated. On this sudden and solid foundation, and its observance, depended the success of the Paper Control during the ensuing years, although nobody at that time remotely anticipated how far the Control's efforts would extend.

Naturally, this order was not received with total acclamation and voices were raised declaring in no uncertain tone that the Trade would be ruined and could not possibly function in wartime, with costs of production already mounting, under such restrictions and prices. The Controller was urged to offer some relief "to a poor distracted trade trying to operate under war conditions on prewar prices." The official mind, however, was adamant and no relief was forthcoming until eight weeks later when the No. 5 Order appeared. In the ordinary way, eight weeks is not a long time, but every day in these eight weeks was important. This short period proved sufficiently long to bend the industrial mind in the way it was intended it should go. By the new order, prices were raised 20 per cent to 50 per cent, but simultaneously with this relief came another shock. The entire stocks of wood pulp, pulp wood and esparto grass throughout the country were purchased by the Government. Late arrivals received since the war had started were purchased at their advanced prices and all these materials were sold back to the makers, as required, at slightly higher prices, but at such prices which would bring the cost of the finished article within the range of the No. 5 Order. Later shipments arriving after the order was published at even higher costs were sold to the makers at the same fixed prices. Thus the Papermakers' material costs were kept on an even keel for a period and although it was anticipated that this level of prices could not be maintained for long in actual fact they were held for several months by which time the Trade had become acclimated to war conditions. We must remember, however, that the time of which we are writing covered that period to which our American friends rather humorously referred, and we concurred, as the "Phoney War."

Just after the turn of the year hints appeared in the trade press of the possibility of paper being rationed. While these at first were not taken seriously; the difficulties of the moment were sufficient without worrying about the future. It was obvious

that the growing demands on shipping were going to be felt somewhere and restrictions in the importation of materials pointed to one possible source of saving tonnage. Soon, therefore, it became apparent that rationing was in the offing, consequently, when, in March, 1940, the first three months rationing period started it created little surprise. The initial form of rationing was not too severe for the mills were only restricted to 60 per cent of their prewar deliveries, any excess of this 60 per cent being subject to special license. It did, however, put a stop to any business not handled in the prewar reference period. Only from mill to merchant was paper rationed. The merchant was allowed to do as he pleased with his supplies of paper, but it was obvious that in order to retain the good will of his customers he also had to introduce a form of rationing even if this was unofficial. It was also quickly noted that the rationing was on a weight basis not reamage. Thus by the utilization of thinner substance papers nearly the same total reamage could be obtained. With this relatively light form of rationing, future prospects were not too bleak and trade could almost carry on as heretofore.

Although the first rationing period produced its anticipated quota of difficulties, somehow or other these were surmounted by a harassed and inexperienced control staff (which by now had swollen considerably) aided by that extraordinary British trait of efficiently muddling through. At any rate progress was being made, and it was thought that as the weeks progressed the difficulties would be lessened, but unfortunately we reckoned without the Nazi. By the time the first license period was in full swing, the bottom fell out of the British paper world. Norway and Denmark were invaded and occupied, Holland, Belgium and France were attacked and within a few weeks had surrendered to the Germans. On top of this Italy declared war. As great as this continental catastrophe was, its real meaning to the British Paper Trade was that the Baltic and the Mediterranean were closed. In short, all sources of paper and papermaking material importations; i. e., paper and pulp from Scandinavia, esparto grass from Africa, rags from Belgium, Holland, and France were cut off. The British Paper Trade was stranded.

To conserve what paper and materials were in existence needed swift action; consequently, on April 12 when it appeared that the German progress would not be stopped, the ration quantity of paper was halved from 60 per cent to 30 per cent and the value of the licenses already granted were also cut in half. After the first period every sheet of paper was subject to license. From that time, little that was not intended for the prosecution of the war or for absolutely essential purposes was allowed to be delivered. Practically all grades of wastepaper were added to the list of controlled materials, and every few days some new order was issued. These cut down bit by bit the usage of paper in industry and for private purposes. Incidentally, from the beginning of the war newspapers had voluntarily reduced their size from 16/24 pages to 8 (later 4) pages. From May 26, the No. 16 and succeeding orders put a stop to any new magazine or periodical, newspaper contents bill, nearly all poster printing, advertising circulars were reduced to 1/3 prewar and the unnecessary packing of wholesale and retail goods discontinued. The making of serviettes, doilies and similar articles was prohibited, picture post cards, greeting cards, were scaled down to a minimum, and later the number of pages a weekly newspaper could use was strictly controlled. Even the weight of envelopes for graphophone records was reduced to the substance of 20 in. x 30 in. 40 lb. 500s. The size of menu cards and programs was drastically curtailed, and compliment slips and visiting cards practically discontinued. Finally, news agents were prohibited from returning unsold copies of newspaper and periodicals which naturally caused them to buy carefully. So the process of the disuse of paper continued until we reached the peak, or should we term it the abyss, of restriction with the No. 48 Order. This went so far as to prohibit the wrapping of all retail articles unless they happened to be wet goods such as meat or fish. It controlled advertising space, put a stop to guide books and directories on an advertising basis, and even the sizes of labels were restricted. The manufacture of writing paper in a larger size than octavo was prohibited, and the size of photographic paper for a single object defined. Calendars and diaries were reduced to the lowest possible weight, and a little later even checks were cut down in size.

As mentioned above, the entire sources of imported papermaking materials were cut off from this country and the British Paper Trade was thrown back entirely upon its own resources. The possibility of finding abundant papermaking materials at home was extremely small, but an effort was made and it has to be recorded that thanks to the co-operation not only of the Trade but the general public a remarkable degree of success was attained.

First and foremost it was decided to rout out every possible sheet of wastepaper which was lying in homes and businesses. A nation-wide salvage campaign was conducted and all office correspondence which had been accumulating during past years was brought to light. Coupled with this was another campaign for the collection of books, and this alone resulted in the receipt of over fifty million. These were carefully sorted by a team of experts and those which were suitable for reading matter for the forces were dispatched to units at home and overseas, some helped to restock blitzed libraries and the remainder were sent to the mills for repulping. Here and there an extremely valuable book was discovered and the stories of these discoveries were a romance in themselves. This campaign of wastepaper was continued throughout the war. Every householder was urged to put her wastepaper in a separate bundle and these bundles were collected week by week by the local authorities who passed them through the channels of the recognized wastepaper merchants. Naturally, after the first few months, which were so fruitful, the quantity of wastepaper collected began to decline mainly because the quantity of paper being used and purchased was in itself declining rapidly and newspapers, as stated above, had been reduced to four pages. In connection with the wastepaper campaign a committee was formed under the direction of the Minister for Salvage. This committee was mainly responsible for organizing the paper salvage drives throughout the various industries. As an incentive to greater salvage, several exhibitions were arranged with appropriate titles of "Paper goes to War," "Paper in Battledress," etc., and these exhibitions toured the country.

Concurrently with the nation-wide salvage campaign attention was directed to other possible home sources of material supplies chief among these being straw which proved to be one of the main supports of the British Paper Trade from 1940 onwards. The principal difficulty with this material was that it needed boiling and only those mills which in prewar handled esparto grass and, therefore, had the necessary boiling plant were capable of treating straw. However, an appreciable quantity of new fiber of very good quality was obtainable from this source. Unfortunately, the yield from this material is only about 25 per cent; thus while it provided fresh

fibers it was expensive in its demand on coal. Nevertheless, the papermaker who in the past never had used straw to any extent set his mind and energies to overcoming the difficulties attached to this new material. As the war progressed, so the quality of the paper produced improved, so much so, that the papermaker was accused of concentrating on quality to the detriment of quantity.

When the papermakers came to handle this material in vast quantities it can be appreciated that their initial efforts were not completely successful, but a number of meetings were held from time to time throughout the country at which they frankly pooled their experiences and compared their difficulties. Out of these conferences were gradually evolved the best methods of manufacture. The quantity of straw used was in the region of 350,000 tons annually, and although this fiber was looked upon purely as a wartime measure (it was generally accepted that after the war the maker would revert to esparto grass at the earliest opportunity), it was felt that certain wrapping and board mills mills might continue its used based on the past five years experience.

Another source from which a fair amount of new fiber was obtained was from the woods and forests of England. It was a sad sight to see so many of the beautiful trees of which this tiny island is immensely proud ruthlessly destroyed for the purposes of war. These trees were cut down and sent to the woodyards, and when the timber merchant had met his requirements the waste wood, saw dust, and shavings were passed to the paper mill. It is an extraordinary commentary on the industrial world that whereas this accumulation of wood waste is always a source of danger to the timber merchant for fear of fire, in wartime a useful purpose for this dangerous material is found in the manufacture of paper. Apart from waste, straw, wood waste, and small importations of wood pulp other minor fiber producing materials helped in the general effort.

We have so far confined our remarks to the official mind and its endeavors to meet war requirements with the means at its disposal—we have not touched upon the papermakers' reaction to all these efforts.

Without an intimate knowledge of what happened inside every mill, it is impossible to give a comprehensive picture of the magnificent struggle and heart-rending efforts of the papermakers to circumvent the ever-growing list of difficulties which mounted year by year. Certainly the most trying time was the period from 1939 to the end of 1942. Although the position did not actually improve after that date, it may be said that by then the trade had completely organized itself on a war footing.

Naturally, with a declining quantity of new fiber the first thing to suffer was the furnish of the various papers. War standards of furnishes were arranged and these were subject to revision at every succeeding license period. Here the many grades of wastepaper played an important part, but these in themselves obviously declined. The lowest form of waste was, quite by accident, termed No. 13. Some evil spirit must have arranged this reference number for at one time it was the only unlicensed waste. This fact alone is an indication of its extremely poor quality. It became the standing joke of the trade, for the "foreign" matter found in consignments of No. 13 waste; from old spades, broken crocks, and refuse of all descriptions, beggars imagination. However, it was made to serve its turn, and very useful it became in the production of common browns and other wrapping, also a considerable number of the cheaper grades of boards.

Concurrent with the difficulties arising out of producing paper from unusual furnishes was the constant demand made upon the mills by the Manpower Board. Not only were staffs gradually depleted, but it was the younger and more active men who had to go, consequently mills were left with staffs of old men, while the women folk who could have helped in the salle and other light jobs were also called to the services or preferred munition making. It is on record that one small mill was trying to carry on with two cripples, one deaf worker, one dumb worker, and two imbeciles on its staff. At one time, the position became so acute that the Ministries concerned had to be warned that further depletion would mean the impossibility of producing the paper required for the war effort. A move was made to concentrate some of the mills but the obvious impracticability of the procedure caused it to be dropped in favor of contraction.

On top of all these difficulties the quality of the coal supplies gradually deteriorated as also did the quantity available.

While the mills were submitting to these difficulties, they were being pressed more and more by the government departments for extra paper and it is to their lasting credit that these constant demands were met.

One extraordinary feature of the war years was that although the papermakers were handicapped in every direction, they chose this period to put their house in order. Their annual reports disclosed an unusual amount of activity most of which was, of course, due to the exigencies of the war. Apart from dealing with the constant recurring troubles of coal, transport, labor and prices, and continual meetings in various parts of the country, and with the Paper Controller at Reading they brought to fruition a scheme which had been suggested just after the last war; namely, the formation of a research association under the title The Papermakers Association Industrial Research Section. Supported by practically every paper mill in the country it received the Government's blessing in the form of financial support. The Association came into being on the first of January, 1944, and its purpose was "To promote research and other scientific work in connection with the Paper and Board Industry and Allied Trades." It was proposed to build laboratories and workshops and to set up a bureau for the purpose of disseminating the knowledge thus gained.

Another very heavy task was the compilation of a comprehensive plan for the reorganization and extension of the industry immediately the war ended. This was divided into two parts: the first, a policy which might have the blessing of the Government; the second, a policy to be carried out within the Trade—a domestic policy. The first part was presented to the various government departments concerned and the Trade is now awaiting its approval and execution.

Another heavy piece of work successfully concluded was the complete overhaul of the Trade Customs. These were revised, submitted to the National Association of Paper Merchants for approval and issue.

These few notes only touch the fringe of the subject of the British Paper Trade in World War II for it is too early yet to present the whole story, recounting the many journeys to Reading, the lively meetings there, also of those in London with government departments, the strange and unorthodox things that were happening at every mill, the many hours of labor lost through enemy activity, the casualties among mills and employees, and the tenacity with which both management, staffs, and work people kept to their tasks despite a continually lowering standard of personal comfort, the monotony of basic foods which in themselves were in short supply, the extremely long hours coupled with nights and week ends on home guard or firewatching duties and over and above it all the awful and depressing blackout.

Great Northern Paper Co. Pulpwood Drive

BELOW—Loosening a jam to permit pulpwood to continue downstream. Bolts 4 ft. long. RIGHT—(Above) Farther down Wallagrass Stream, pulpwood being thrown into the drive. (Below) View of clerk's cabin. Jobber with jacket. Clerk at jobber's left. At jobber's right are the cook and two cookees.

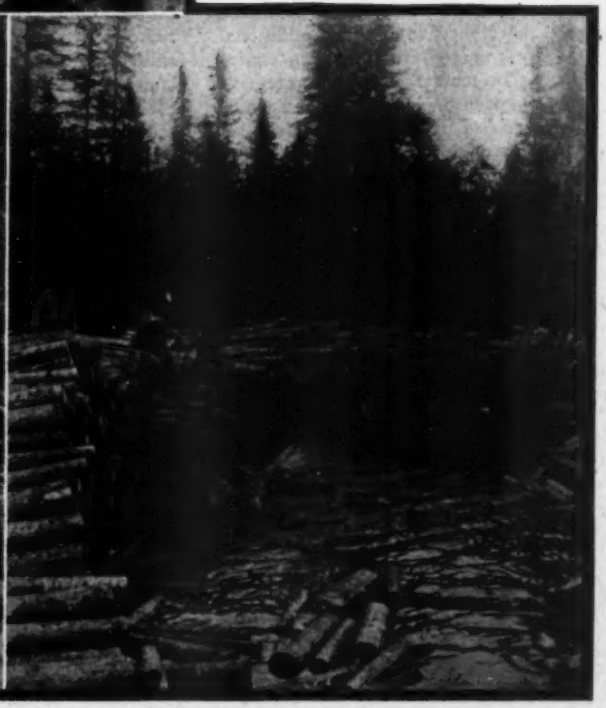
(All photographs by Frederick J. Shulley, Pulpwood Production Branch, Paper Division, War Production Board.)

LEFT—Wallagrass first Lake, 12,000 cords of pulpwood in storage. Pulpwood brought, as needed, from boom over to loader in foreground and loaded onto four trucks at the same time. Trucked to Wallagrass, Bangor & Aroostook Railroad station and then by rail to mill at Millinocket.

RIGHT—Part of 35,000 cords of pulpwood cut during past winter at two camps operated by Great Northern Paper Company on Wallagrass Stream and Wallagrass Lake. Great Northern Paper Company mills located at Millinocket and East Millinocket, Maine. Wood cut by two camp crews totaling perhaps 100 men. Pulpwood then stacked in and adjacent to frozen stream, channel Spruce and fir were species cut and piled.

LEFT—Pushing pulpwood bolts into Wallagrass Stream with pike poles. Water in foreground about 7 to 10 feet deep. After clearing channel, pulpwood thrown in from piles on shore. Men work downstream, allowing them to throw back any wood that becomes lodged along banks. In this way, all pulpwood is moved down to Wallagrass Lake where it is stored until needed.

BELOW — (At left) Pulpwood on way downstream to storage in Wallagrass Lake. (At right) Throwing pulpwood into Wallagrass Stream from piles along channel.



Protecting Workers from Toxic Effects of Organic Solvent Vapors*

▶▶▶ All volatile organic solvents, including gasoline, benzene (benzol), naphtha, carbon tetrachloride and trichlorethylene, give off toxic vapors. Hence, workers using any of these solvents in cleaning, degreasing, cementing, and other operations must be protected from the effects of inhaling excessive amounts of their fumes.

Basic protection is provided by keeping the concentration of solvent vapors in the general atmosphere of the workroom below "the maximum allowable concentration (M.A.C.) for continuous exposure."

This limit, which represents the maximum concentration of solvent vapor to which workers may be continuously exposed during the eight-hour work day, has been established by the American Standards Association for several of the commonly used solvents, but many states have standards of their own.

Natural ventilation may suffice to provide this basic protection where the contamination of the atmosphere is slight, as where the solvent is being used in small quantities or is applied in equipment that prevents the escape of vapor. In other cases, it may be necessary to employ some form of mechanical ventilation, such as a local system which will draw off the vapors as they arise.

Working conditions in a plant are probably satisfactory if the air is free from the pronounced odor of the solvent being used; but, since odor is not an adequate criterion, an atmospheric survey should be made. This requires the services of a competent chemist. In some states, such work is done by the State Industrial Hygiene Department on request.

However, even where the workers as a group are effectively protected by these measures, certain individuals may be endangered by practices like the following:

Using solvents in poorly ventilated areas, such as small rooms, basements, pits, etc.

Applying solvents in close proximity to the face, as in spotting garments or cleaning floors or machinery.

Working over open containers of solvents.

Handling products damp with solvents.

Opening containers or equipment holding solvents in such a manner that high concentrations of the vapor are inhaled.

Permitting drafts to blow solvent vapors in the direction of workers.

Allowing persons to work with solvents to which they are abnormally sensitive.

Entering tanks containing solvent vapors without proper respiratory protection.

*Safety Research Institute, Inc.

Planning That New Mill or Additions to Old

(Continued from page 710)

products in the South, the improvement of products in the process of manufacture, the ability to meet the exacting demands for new products, and the ability to produce additional quality tonnage from existing equipment. In general, existing plants have a program of expansion in mind which has been "in process or on order" for several years. Now is the time to go into action on these projects, to lay the job down on paper, and be ready to start the work at such time as the opportunity is presented.

It is our firm belief that not only this Industry but most others are cognizant of this fact; and collectively there is a sub-rosa program of construction work and major industries project contemplated that should be sufficient to keep a large number of skilled and unskilled men busy for a considerable period of time; and by so planning and having an approved constructive program, duly authorized, for execution, it is quite possible that we may eliminate the undesirable period of postwar inactivity that might result from the lack of such a plan.

Our contracts with mill owners and paper mill equipment manufacturers, engineering firms, and contractors, all indicate that there is a goodly volume of such planned work ready to be issued. Foreign business undoubtedly will add much to the schedule, but it will take a lot more to keep the available manpower busy, so may we suggest that such work as appears to be needed be now laid down, keep our lamps trimmed, and not be the last on the vendors order list, for after all it is the equipment which makes the salable goods.

Animal Glue as a Paper Sizing and Coating Adhesive

(Continued from page 712)

the paper, and too little inhibits penetration of the size, correct control is very important.

Although the importance of careful size preparation and use control have been stressed, it should be emphasized that meticulous adherence to formulae will not produce a high quality product unless the drying process, which follows, is just as carefully controlled. Only with proper drying will the maximum benefits of glue sizing on strength of paper and resistance of paper to water and ink be fully realized.

Loft drying, the oldest mechanical method of drying, is still in use by some mills for the drying of the finest papers. In this method, if wet packed, the paper is cut into sheets and piled on a lay-boy as it comes from the size press or roll. These sheets are then hung over poles in the loft room where a temperature of approximately 86 Fahr. is maintained. Air circulation at this temperature removes the water.

In loft drying, the paper shrinks and cockles. Yet, even with these disadvantages, the method has retained a definite place in the drying of highest quality paper.

When production operations demand greater tonnage per unit of time than is conveniently possible with loft drying, glue sized paper is dried on cylindrical steam heated dryers similar to paper machine dryers, or is fastened and dried with heated air.

EDITOR'S NOTE: This article is in two parts. Part II will appear in the September issue of this magazine.

Sulphite Turpentine...

a Review of the Literature*

T. T. COLLINS, Jr.
Thilmany Pulp & Paper Co.

▶▶▶ IN HIS EXCELLENT REVIEW of the history and chemistry of p-cymene, Austerweil (*1*) has mentioned that from the time of its discovery in 1839 until Widmann worked out its correct structure in 1891, p-cymene was believed to be the n-propyl methyl benzene. Later, in 1900, Klason (*3*) determined the composition and formula of p-cymene separated from sulphite turpentine and thus proved its existence in that material.

Chemical and Physical Properties

Waller (*5*) described pure cymene as a colorless liquid with the characteristic odor of its homologs, toluene, xylene, etc., and similar physical properties, although different in degree, in keeping with its higher molecular weight. The correct name for cymene is 1-methyl-4-isopropyl benzene (Figure 1). The following physical data (Table 3) have been given by various investigators.

(According to Waller (*5*), p-cymene is not rated as a flammable oil because of its flash point.)

Physical data comparable with that shown in Figure 1 have been given by Karvonen (*64*) and others. In addition, Wheeler (*71*) has given solubility values for various materials in cymene and Kobe, Okabe, Ramstad, and Huemmer (*73*) have studied the vapor pressures of p-cymene and a number of its derivatives.

Although no involved research on the subject has been done and the question still remains partly unanswered, nevertheless the problem of understanding the mechanism of the conversion of terpenes in wood into p-cymene in the sulphite pulping process has attracted the attention of chemists in the past. A review of the literature on the theories of the formation of cymene during sulphite pulping has been published by Kaminskii and Khodakov (*24*).

One of the earliest investigators to advance a theory to explain the production of cymene and similar hydrocarbons in the sulphite turpentine was Kertesz (*46*). He thought that the reducing action of the sulphite on the resin in the wood followed by other complex reactions is responsible.

Aschan (*74*) suggested that sulphur dixide and sulphites at high temperatures and pressures tend to split off hydrogen from terpenes like pinene, sylvestrene, and dipentene and that this results in m-cymene as well as p-cymene. As a result of this formation of more than one isomer of cymene, some obscure problems in the substitution reactions of cymene from sulphite turpentine may be explained. Another source (*75*) also lists o-cymene as one of the by-products of the sulphite process.

Although he could offer no definite proof of his theory, Murto (*76*) concluded that the terpenes are oxidized to alcohols which are then dehydrated

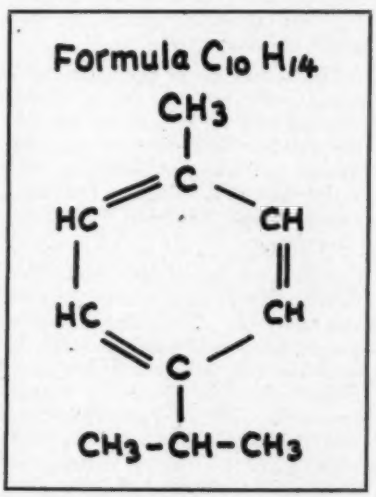


Figure 1

by the action of sulphur compounds in the sulphite cooking liquor to yield p-cymene.

The analogy of the oxidation of terpenes to cymene by the bisulphite ion with a similar oxidation in the case of some sugars has been drawn by Haegglund (*77*). Routala and Pohjola (*78*) concluded that the reaction depends upon the oxidizing effect of sulphur dioxide under acid conditions and found that sulphite cooking acid will not convert terpenes (pinene) into cymene unless wood chips are present. Wise (*50*) described the following steps in the reaction as Routala and Pohjola believed them to take place:

Pinene $\xrightarrow{\text{(hydrolysis)}}$ Terpineol $\xrightarrow{\text{(dehydration)}}$ cymene.

Terpinenes $\xrightarrow{\text{(dehydrogenation)}}$ cymene.

Similarly, Baroni (*59*) described the conversion of pinene to cymene as a ring splitting. According to Wise (*79*), "Kurth refers to a possible mechanism of the formation of cymene from terpenes through ring fission and dehydrogenation."

Uses and By-Products

Although it appears that sulphite turpentine has at present no industrial use in the United States, nevertheless reports indicate that it is being used where available in European countries. It remains to be seen whether or not it will continue to be used in those places when the normal flow of raw materials between the various countries is resumed after the war as it may be of no economic advantage to recover and market it in competition with p-cymene from other sources or materials from which similar by-products can be manufactured.

However, many uses have been suggested for the derivatives of p-cymene and in some instances the sulphite turpentine has been found suitable for some purposes without further modification beyond a partial purification. Wheeler (*71*), Mann, Montonna, and Larian (*60*), and Kaminskii and Khodakov (*24*) have suggested its use as a solvent and it has been mentioned by Groggins (*80, 81*) as a substitute for turpentine in paints and for toluene in lacquers. However, it was found to be too expensive to compete with those materials or the mineral spirits used in the paint and varnish industry. Felton (*31*) and Nickerson (*16*) have stated p-cymene to be unusable in paints because of an offensive odor and because the oil is non-drying. For the latter reason, p-cymene can be considered only as a thinner of low volatility. The use of p-cymene in paint and varnish removers has been found to give improved results according to Groggins (*62*), Austerweil (*1*), and Phillips and Goss (*82*).

The use of p-cymene or its derivatives as addition material to fuels for

(*) This installment concludes the article. It has been published in two parts—Part I appeared in the July (1945) issue of this magazine.

internal combination engines has been recorded in the literature. Groggins (*62*) stated that as early as 1909 the University of Wisconsin experimented with p-cymene as a motor fuel and Holtan (*25*) mentioned its potential use for that purpose in Scandinavia. Kaminskii and Khodakov (*24*) report that in Russia p-cymene is as valuable as isopropyl benzene as an additive to high octane aviation fuels since it has an octane number of 128 and a derivative, aminocymol, was said to be even more effective for this purpose. Wise (*50*) has said that a derivative, carvacrylamine, also has been used as an antiknock agent.

As for the derivatives of p-cymene, probably the greatest potentialities exist in their production since p-cymene appears to be, chemically speaking, a very versatile raw material for organic syntheses. In the past, much interest in the reaction of p-cymene has been shown by various investigators and several reviews on the chemistry of this material have been published. The paper by Austerweil (*1*) is an excellent summary of the work done in this field prior to 1926 while several later papers by Ullman (*22*), Wise (*50*), Palmer (*83*), and others have brought the knowledge up to date. It is felt that an involved discussion of this phase of the subject would exceed the scope of this review and for that reason only a brief summary of past work can be given.

It was Austerweil (*1*) who has furnished much of the following outline of the chemical treatments given p-cymene for the production of numerous derivatives.

1) Decomposition reactions of p-cymene

2) Substitution reactions with p-cymene

   a. Sulphonation
   b. Nitration
   c. Oxidation in the ring
   d. Substitution of carbon-containing derivatives in the ring
   e. Oxygenation of the lateral chains of p-cymene
   f. Production of derivatives by opening of the ring
   g. Halogenation
   h. Mercuration of p-cymene
   i. Hydrogenation

Mention has been made in several papers of toluene as one of the major decomposition products of p-cymene. Its production from sulphite turpentine has been discussed generally by Aschan (*19*), Wise (*50*), Jahn (*7*), and others (*48, 37, 18,* and *17*). Anschütz (*84*) in 1886 first produced toluene from p-cymene by heating it with aluminum chloride and further experiments along these same lines have been carried out by Rittman (*85*), Moore and Egloff (*86*), Boedtker and Halse (*87*), Halse and Dedichen (*88*), *Schorger* (*9*), and Wheeler (*68*). One patent (*89*) described the production of propylene and toluene by the catalytic decomposition of p-cymene by fullers earth at elevated temperatures and Bergstreom, Cederquist, and Trobeck (*90*) have devised a process of producing p-cymene and toluene and propylene from pinene by treatment with mixed catalysts consisting of activated carbon or metals and silicates or zinc chloride. An excellent review of the chemistry of these various reactions has been given by Austerweil (*1*).

TABLE 3

Molecular weight	134.11	
Melting point	—73.5 C.	TAPPI (*33*)
Boiling point	177.0 C. (760 mm.)	Boedtker (*51*)
Specific gravity	0.8606 (15 C.)	Boedtker (*51*)
Refractive index	1.4920 (18 C.)	Boedtker (*51*)
Flash point	100 C.	Ullman (*22*)

The conversion of p-cymene, when mixed with benzene and aluminum chloride into toluene and cumene by the Friedel-Crafts reaction has been studied by Halse and Dedichen (*88*), Austerweil (*1*), Wheeler (*68*), and Kaminskii and Khodakov (*24*).

The substitution products of p-cymene have been by far the richest field for research in connection with this material. The sulphonation of p-cymene to yield sulphonic acids has been a subject of investigation or has been discussed by Weiss and Wotherspoon (*91*), McKee, Lewis and Hixson (*92*), Phillips (*93*), McKee (*94*), Ullman (*22*), Klason (*3*), Austerweil (*1*), and Newstrom and Kobe (*95*).

The nitration of p-cymene has been of considerable interest in the past, and Austerweil (*1*) has thoroughly discussed the chemistry of the nitro-compounds. Nitration and the preparation of other nitrogen-containing derivatives have been mentioned by Newstrom and Kobe (*95*), Ullman (*22*), and others (*17*). Halse and Dedichen (*88*) stated that nitration products of cymene can be produced only in low yield but later work does not appear to bear this out. Wise (*50*) discussed the production of nitration derivatives for fuel antiknock agents and Wheeler and Smithy (*72*) nitrated p-cymene and produced diazo compounds from the nitro-products. Kobe and Roumani (*96, 97*), have studied the production of various derivatives of p-cymene upon nitration.

Evidently these nitrated products of p-cymene and their derivatives are of considerable interest in the production of dyestuffs as they have been used or suggested for that purpose by Aschan (*19*), Kaminskii and Khodakov (*24*), Phillips (*65*), Andrews (*98*), and others (*99*). Kirjakka (*100*) found sulphite turpentine unsuitable as a starting material for the preparation of organic dyestuffs due to the formation of undesirable by-products during the manufacturing processes. Austerweil (*1*) has described the production of medicines and anesthetics from nitro derivatives of p-cymene.

Oxidation of the p-cymene ring gives compounds analogous to phenols and of particular interest are carvacrol, thymol, carvomenthol, and menthol. This field has been investigated or discussed by Austerweil (*1, 101,* and *102*), Hixson and McKee (*92*), Austerweil and Lemay (*70*), Phillips (*103*), Mann, Montonna, and Larian (*60*), Phillips and Gibbs (*66*), Schorger (*9*), McKee (*94*), Aschan (*19*), and Wise (*50*).

The substitution of compounds containing several carbon atoms in the p-cymene ring leads to the production of materials useful in perfumes, according to Austerweil (*1*).

Cuminic aldehyde is one of the most important derivatives of p-cymene produced by oxygenation of the lateral chains. Austerweil (*1*) has reviewed the chemistry of these reactions.

Of the derivatives listed by Austerweil (*1*) as being produced by the opening of the p-cymene ring, menthone, citronellal, rhodinol, and carvomenthone are among the most important.

Groggins (*80*) has described the chlorination of p-cymene to produce a resinous material useful in chemical-resistant and marine paints.

Bromination of p-cymene has been mentioned by Newstrom and Kobe (*95*) and Wheeler and Smithy (*72*) discussed bromination of its nitration derivatives.

The production of derivatives of p-cymene by mercuration has been investigated by Newstrom and Kobe (*95*).

The hydrogenation of p-cymene to p-menthane was studied by Kobe and Vittone (69).

In addition to the derivatives of p-cymene already mentioned, there are many which do not have any known uses. However, still other chemicals based on p-cymene have been mentioned in the literature. Wise (50) has described the production of methyl styrene from p-cymene and Palmer (83) has discussed such products of p-cymene as toluic acid, terepthalic acid, dimethyltolycarbinol, p-methyl - alpha - methyl - styrene, methyl acetophenone, methyl styrene, and others.

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Forest Policy Statement of the Forest Industries Council

▶▶▶ PERMANENT INDUSTRIES capable of producing continuous supplies of forest products are essential to the national welfare. The necessity for wise use of our forest resources in maintaining such industries and the communities dependent upon them is recognized. Having faith that private enterprise and initiative can provide the most effective management, use, and renewal of our nation's forests, the Forest Industries Council pledges united leadership for betterment of America's forests, and the attainment of continuous forest production. In fulfillment of this policy, the Forest Industries Council agrees to:

1) Promote the extension of permanent and dependable protection against fire to all forest lands, irrespective of ownership.

2) Urge all forest owners and forest operators to develop and adopt forest practices designed to insure the continuous production of timber on all areas as harvested, irrespective of ownership.

3) Confirm the sound economic policy of encouraging private ownership of lands which are being or can be profitably managed for continuous production of forest crops, and encourage a national land policy to include the sale and exchange of public lands in order to restore desirable lands to private ownership as well as to consolidate public holdings.

4) Encourage public ownership and practical management of forest lands which are incapable of producing sufficient wood to maintain profitable private ownership.

5) Advocate equalization of state and local taxes on forest land that reasonably support their fair proportion of local responsibilities and that encourage private ownership of forest lands.

6) Support in each forested state a competent, adequately staffed and financed state forestry organization, qualified to manage state-owned forest lands, to administer and enforce state laws relative to privately owned forest lands, and to provide adequate cooperation with all timberland owners in the state in solving forest problems.

7) Support public regulation when necessary or desirable, to be administered under state law. The need or desirability of such regulation and its scope if undertaken to be determined by the people of each state.

8) Co-operate with public and private agencies in the control or abatement of major forest insects and diseases.

9) Develop more complete utilization of forest products.

(Released by the American Forest Products Industries, Inc.)

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▶▶▶ MORE PULPWOOD than has ever been produced in any six month period in the nation's history will have to be delivered to U. S. mills by American pulpwood workers during the last six months of this year if the 1945 War Production Board quota of 16,000,000 cords is to be attained, according to a statement issued by the War Activities Committee of the Pulpwood Consuming Industries.

Basing its statement on data obtained from the Forest Products Bureau of the War Production Board, the committee pointed out that 8,350,200 cords of domestically produced pulpwood must be delivered to mills during the last half of this year to offset the production lag that occurred from January through June.

Helpful Hints For Nomographers

D. S. DAVIS
Wyandotte Chemicals Corporation

▸▸▸ REFERENCE TO recent bibliographies of chemical engineering nomographs (*2, 4*) shows an unprecedented interest, on the part of pulp and paper technical men, in these efficient tools. Inspection of some of the charts, however, reveals questionable practices and awkward situations with respect to details of presentation. Though the theory and construction of alignment and line co-ordinate charts has been adequately covered in texts (*1, 3 , 5*) designed to suit every need, none devote sufficient space to a discussion of good drafting practice as it bears on many points of particular interest to the beginner. It is the purpose of this article to make a number of definite suggestions concerning scale graduations, index lines, legends, and keys.

Directions of Scales—Design the chart so that as many scales as possible increase upward in the manner of the familiar thermometer. This is especially advantageous where the chart is to be used by the non-technical. In the case of horizontal scales these should increase from left to right, preferably.

Construction of Scales — Use a sharp 6H pencil in ticking off the desired points on axes lightly drawn with a 4H pencil. When marking off scales the axis should be in a horizontal position and the master scale or mechanical aid should be placed about 0.5 mm. above the axis. Use two dots,

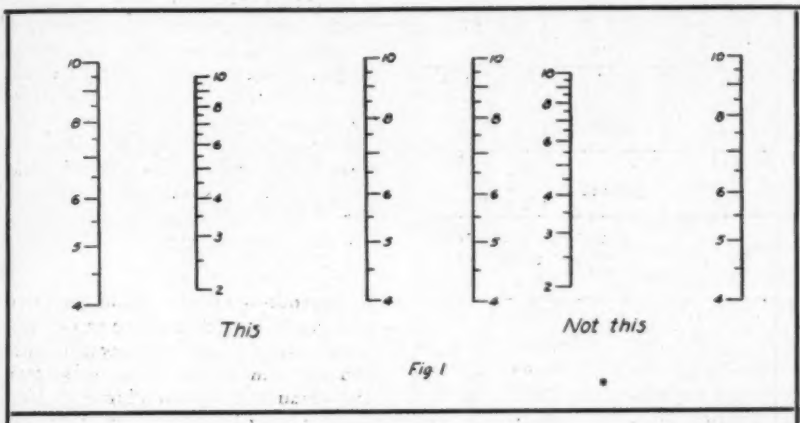


Fig 1

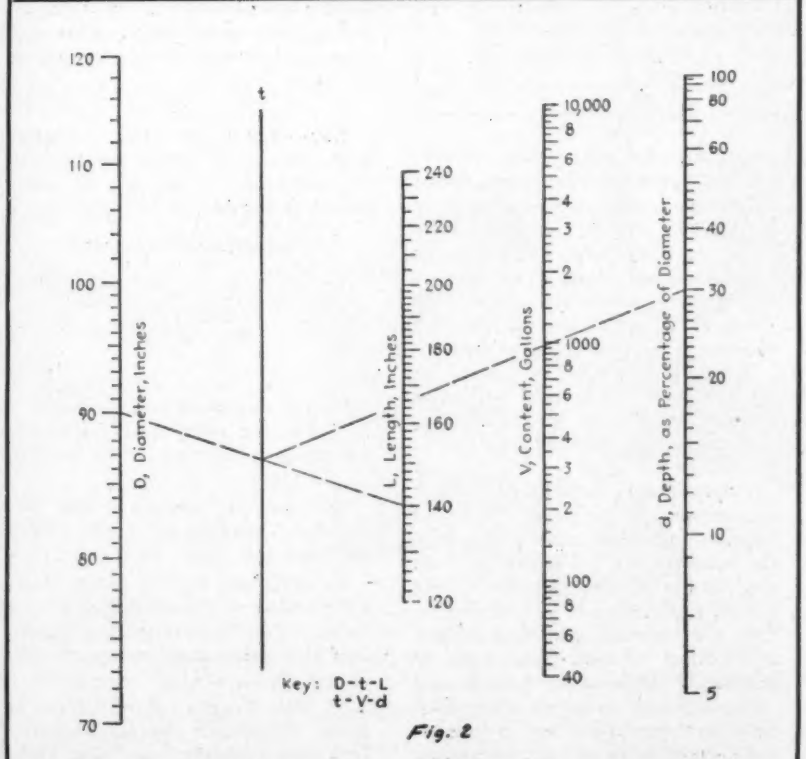


Fig. 2

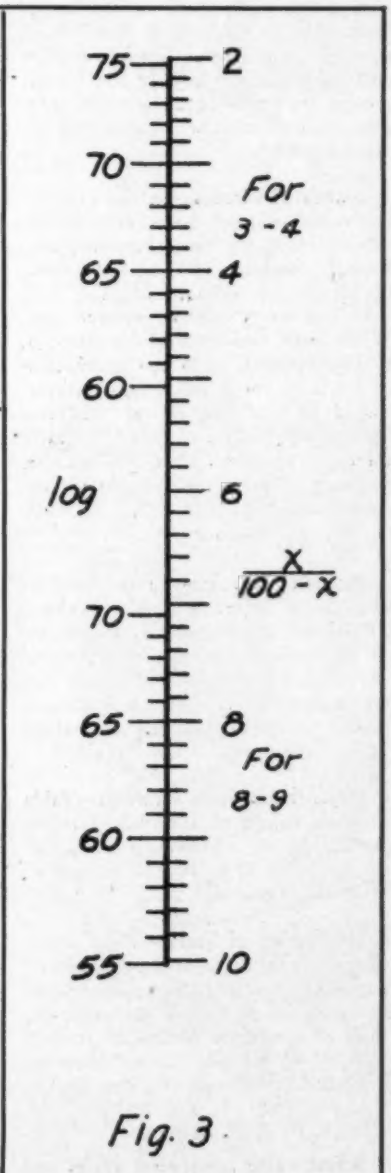


Fig. 3

one on the axis and one just below it, at every fifth or tenth point, to indicate the need for longer strokes or "whiskers." This is especially helpful in transfering logarithmic scales from a mechanical aid to the axis since the spacing interval may be one, two, five, or ten units at various positions in the logarithmic cycle.

Graduation of Scales—Axes should not be graduated more closely than the data warrant and scale divisions should seldom be closer than 2 mm. Closer graduation is sure to reveal the inherent vagaries of handwork and result in a scale that is hard to read. Where space is limited, five subdivisions are more pleasing to the eye than ten, and are fully as accurate. When graduation to 0.1 unit would be too close, graduation to 0.2 unit or to 0.5 unit should be considered. The use of 0.25 unit graduations is usually confusing, though the subdivision of inches into the familiar fourths and eighths is often justified.

Length of Strokes—In the case of charts intended for the usual ¼ to ½ linear reduction on reproduction, strokes or whiskers of 3, 4.5 and 6 mm. in length are suitable for the 0.1, 0.5, and unity points, respectively. When only two sizes of strokes are to be employed, as in the graduation to 0.2 unit, the 3 and 6 mm. lengths should be used for greater contrast. Some prefer lengths of 3.5, 5.5, and 7 mm. for the three sizes. When the graduations are unusually close (less than 2 mm.) lengths of 2.5, 4.5, and 6 mm. are recommended.

Position of Strokes—In the case of axes at the left and right the chart the strokes and numbering should be on the outside, though this procedure is not economical of space. For the intermediate axis, the strokes and numbering should be on the side where there is more room, as in Figure 1.

Logarithmic Scale Intervals—Table 1 gives suggested intervals for the graduation of logarithmic scales for the cycle of 1 to 10 for moduli of 4 1/6 to 100 cm.

Numbering of Scales—For the cycle of 1 to 10, logarithmic scales of a modulus of 12½ cm. or less should be numbered at 1, 2, 4, 6, 8, and 10; those of a modulus of 25 cm. at 1, 2, 3, 4, 5, 6, 8, and 10; and those of a moduli of 50 and 100 cm. at 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.5, 3.0, 3.5, 4, 5, 6, 7, 8, 9, and 10.

Where there are several cycles and the numbering is high, as 100 to 1,000,000, the 100, 1,000, 10,000, 100,000 and 1,000,000 points should be written as such, as in Figure 2, or as 10^2, 10^3, 10^4, 10^5, and 10^6 while merely 2, 4, 6, and 8 will suffice for the intermediate points. This obviates clutter in the chart and increases the "white space" which is as desirable in a nomograph as in advertising matter.

Where intervals of two occur in the numbering of natural or nearly uniform scales even numbers rather than odd numbers should be used.

TABLE 1

Modulus (cm.)	Range	Interval
4-1/6	1- 2	0.2
	2- 6	0.5
	6-10	1
6¼	1- 3	0.2
	3-10	0.5
8-1/3	1- 2	0.1
	2- 4	0.2
	4-10	0.5
12½	1- 3	0.1
	3- 6	0.2
	6-10	0.5
25	1- 2	0.05
	2- 6	0.1
	6-10	0.2
50	1- 2	0.02
	2- 6	0.05
	6-10	0.1
100	1- 2	0.01
	2- 4	0.02
	4-10	0.05

TABLE 2

Range of x	Matching Points on a 50-cm Logarithmic Scale
2-3	72-67
3-4	70-65
4-5	69-64
5-6	67-62
6-7	66-61
7-8	64-59
8-9	65-60
9-10	61-56

Approximate Graduations—Many nonuniform scales other than the logarithmic variety are employed by the nomographer. These arise from the nature of the functions being plotted and can not be laid off directly from a mechanical aid for, in theory, the location of each point must be calculated. In practice, however, it is often sufficient to locate every fifth point by computation and to approximate the location of the intermediate points. This is done by matching up the fifth points with certain parts of logarithmic scales of moduli of, say, 25 or 50 cm.

Figure 3 shows a reproduction of a scale based on $x/(100 - x)$ where, in full scale, the modulus was 150. Values of $150\ x/(100 - x)$ are calculated for each unit from 2 to 10 but the graduation to fifths may be accomplished by matching the 2 and 3 points with 72 and 67, respectively, of a logarithmic scale with a modulus of 50, and the 3 and 4 points with 70 and 65, respectively, on the same logarithmic scale. The entire range from 2 to 10 can be graduated by means of matching points on the logarithmic scale as shown in Table 2.

Index Lines—Index lines should actually cross pertinent scales but care should be taken that they do not intersect scales to which they do not refer. Thus, in Figure 2, the short index line is made to cross the t axis and to touch the D and L scales, the long index line crosses the V scale and is made to touch the t axis and the d scale but skips the L scale to which it does not refer.

Legends—Legends should be brief and should be placed at the top of the scales where possible or parallel with the axis and on the other side from the graduations, as in Figure 2. Unless the nomograph is accompanied by descriptive matter the equation and literature reference should appear on the chart.

Key—Where the chart embraces more than three axes, a key showing the order of the use of the scales should be included as in Figure 2.

Literature References

1) Davis, D. S., *Empirical Equations and Nomography,*" McGraw-Hill Book Company, Inc., New York, 1943.

2) Davis, D. S., *Bibliography of Chemical Engineering Nomographs—II,* Document 1809, American Documentation Institute, Washington, D. C., 1944.

3) Lipka, J., *Graphical and Mechanical Computation,* John Wiley and Sons, Inc., New York, 1921.

4) Myllynen, R., and Davis, D. S., *Bibliography of Chemical Engineering Nomographs,* Document 1599, American Documentation Institute, Washington, D. C., 1941.

5) Van Voorhis, M. G. *How to Make Alignment Charts,* McGraw-Hill Book Company, Inc., New York, 1937.

Paper SKETCHES . . . . . .

IT WAS AN OLD CUSTOM IN SPAIN TO BURY, ON ASH WEDNESDAY, WITH GREAT SOLEMNITY, A SARDINE OR A PIECE OF SAUSAGE IN A PAPER-COVERED COFFIN. THIS CEREMONY SYMBOLIZED THE BURIAL OF ALL WORLDLY DESIRES AND PLEASURES.

AS EARLY AS MARCH 10, 1945, PAPER CAPTURED FROM THE GERMANS WAS BEING USED IN LIBERATED AREAS OF HOLLAND TO PUBLISH 22 DAILY NEWSPAPERS, 75 WEEKLIES AND TEN FORTNIGHTLY OR MONTHLY REVIEWS. ABOUT ONE-THIRD OF ALL THE PAPER BEING SUPPLIED THESE PUBLICATIONS AT THE TIME — THE TOTAL BEING ONLY ABOUT 165 TONS A MONTH — WAS COMING FROM DUTCH PAPER MILLS.

IN THE 13th AND 14th CENTURIES, PAPER WAS LOW-PRICED IN THE EAST, BUT COST ABOUT AS MUCH AS PARCHMENT IN WESTERN EUROPE.

ACCORDING TO PLINY (23 – 79 A.D.) IT WAS CUSTOMARY TO USE NOT MORE THAN 20 SHEETS OF PAPYRUS TO THE ROLL.

ALLIED

FALK CORPORATION ISSUES A PICTORIAL HISTORY

A pictorial history The Falk Corporation, Milwaukee, Wisconsin, has been published in a handsome brochure entitled "The Story of 'A Good Name in Industry.'"

The subject so graphically outlined in this fine presentation is told in an introduction displayed across the first three pages of the brochure. It reads: "The Past Foretells the Future . . . Over 50 years of Endeavor and Progress to Build and Maintain . . . 'A Good Name in Industry.'" The following pages set forth the accomplishments of the past from the company's inception in 1892 . . . through World War I . . . Progress Through the Twenties . . . The Thirties . . . The Early Forties . . . preparing for the greatest naval program in history.

The latter part of the book continues with Falk Today . . . graphically portraying that company's war production achievement.

An eight-page insert, beautfully executed, is entitled "To These People—the Task of Molding 'A Good Name in Industry.'" Published here are the names of the company's home office and plant employees. The last page of the insert is devoted to Falk District Representatives & Sales Engineers."

The illustrations are all in color, and the varnished cover of the book is effectively designed. The company has spared no pains or expense to make this piece of work a piece of art.

◆

B-D PICTORIAL HISTORY OF PAPER HAS NOW BEEN PUBLISHED IN BRAZIL

A Pictorial History of Paper, published last year by the Bulkley, Dunton Pulp Company, has been translated into Portuguese, and the entire book, complete with its 22 illustrations, reprinted by the Brazilian illustrated magazine, *Vida Domestica* of Rio de Janeiro. A long editorial in which the Brazilian magazine pays tribute not only to the book but to the pulp, paper and graphic arts industries of the United States says in part—"beautiful text paper was used in the printing of the book, which testifies to the high degree of progress of the (U. S.) industry. The printing and artistic arrnagement are extraordinarily beautiful. So interesting do we consider *A Pictorial History of Paper* and so important is the knowledge therein given that we decided to translate the book as an homage on our part to that very progressive and important industry of the United States, and especially to Bulkley, Dunton . . ."

Illustrations and excerpts of *A Pictorial History of Paper* have been previously reprinted by several United States publications, and the Art Directors Club selected the book to be included in its annual exhibition of representative advertising art. First exhibited at the 1945 Art Directors show in Rockefeller Center, it is now part of a traveling exhibit on a cross-country tour.

◆

INDUSTRIAL TRAINING COURSE IN ELECTRONICS

A new Industrial Electronics talking slide film training course which offers a thoroughly practical and quickly grasped understanding of the subject of industrial electronics, has been announced by the General Electric Company. Carefully organized for presentation in twelve sessions, the new course is expected to have wide use throughout industry wherever electronic equipment is applied or a knowledge of it is required. A large number of industrial and power companies, especially, are expected to find the course highly desirable for effectively presenting to their personnel the fundamentals and applications of industrial electronics.

In industrial plants, the course should provide electrical personnel with sufficient theory and application information to acquaint them with electronics in general; production and process engineers engaged in reducing production costs should find that it offers innumerable practical suggestions; designing engineers involved with improving products should obtain much stimulation and a variety of new ideas; practical electricians should acquire from it an increased working knowledge of electricity and ample information to encourage them to install and service electronic equipment; and production managers and plant superintendents should discover a wealth of opportunities for cracking open production bottlenecks by electronic methods.

In electric power companies, the course is certain to provide new power sales engineers with the background necessary for them to deal helpfully with customers; veteran power sales engineers and other utility men should find it particularly beneficial for "brush up" purposes; and power sales departments should discover that it is ideal for training program purposes for interested men in their industrial customers' organizations.

Price of the complete course (12 slidefilms and records, 25 sets of 12 review booklets, 1 instructor's guide, and a compact, durable carrying case) is $100.

◆

SHARTLE-DILTS CONSUMMATE WORKING ARRANGEMENT WITH ALEXANDER FLECK, LIMITED

In order to broaden the engineering approach to mill problems on both sides of the border, a practical working arrangement has been consummated between Shartle Brothers, of Middletown, Ohio, Dilts Machine Works, of Fulton, New York, and Alexander Fleck, Limited, of Ottawa, Ontario (Canada).

Fleck will handle the entire Shartle and Dilts line in the Dominion, while Shartle and Dilts will promote Fleck products in the States. As of the moment, The Black-Clawson line is not affected.

It is expected this association will make a valuable contribution to mill progress in the years immediately ahead during which time a need for more modern replacement equipment and vastly improved papermaking methods is predicated.

◆

TIMKEN HAS DEVELOPED ELECTRONIC SOUND GAUGING DEVICE TO AID THE BLIND

For almost two years, Timken engineers experimented with various gauges resulting in a new electronic sound gauging device which may mean employment to thousands of America's otherwise unemployable blind.

Early in July, the first public demonstration of this device was given in the Canton Bearing Factory of The Timken Roller Bearing Company, Canton, Ohio. The small audience, composed of high-ranking leaders of the blind, of industry, the American Legion, and the officers of the company, watched in silence while a sightless operator quickly fed the outer races of Timken Bearings into an outside diameter gauge equipped with the new device—at a rate rapid enough to bear comparison with that of a sighted operator.

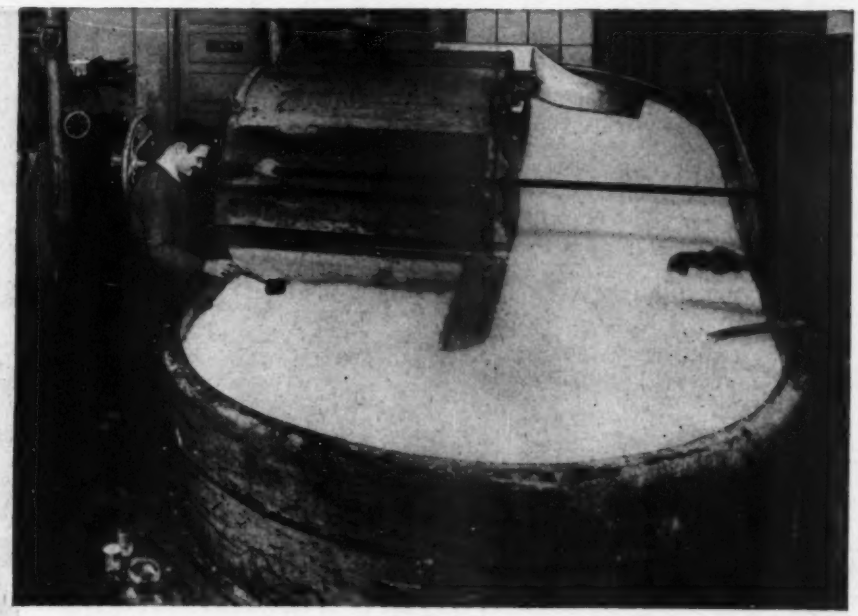
Helen Keller, accompanied by Polly Thomson, her constant companion for more than thirty years, was on hand to reflect what the new gauge may

SPECIFY "GENERAL CHEMICAL"

for quality papermaking chemicals

GENERAL CHEMICAL COMPANY
products for the paper industry

- Aluminum Sulfate (Standard and Iron Free)
- Copper Sulfate
- Muriatic Acid (Hydrochloric)
- Sodium Fluoride
- Sodium Silicate
- Sodium Metasilicate
- Glauber's Salt (Crystal or Anhydrous)
- Salt Cake
- Sodium Sulfide
- Sodium Hyposulfite
- Sodium Sulfite (Anhydrous)
- Sodium Bisulfite (Solution or Anhydrous)
- Disodium Phosphate
- Trisodium Phosphate
- Tetrasodium Pyrophosphate
- Sulfuric Acid
- Nitre Cake (Sodium Bisulfate)
- Nitric Acid



Making quality paper depends to a large extent on the quality of the chemicals used. General Chemical Aluminum Sulfate, for example, either in the Standard or Iron Free grades, will help maintain quality in your paper from the start. General Chemical's carefully controlled production methods insure "Alum" of uniform quality and concentration, and a low percentage of impurities.

Next time, specify these quality General Chemical products for *your plant:*

ALUMINUM SULFATE

Standard—Lump, Ground 99% thru 8 mesh, 95% thru 10 mesh; Powdered, 95% thru 100 mesh.

Iron Free—Lump, approx. 2½"; Ground, thru 8 mesh.

SODIUM SILICATE

Solutions: from 38°—60° Baumé

Appearance: Opalescent to clear

Wt. Ratio (Na_2O to SiO_2) from 1:2.00—1:3.40

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FOR AMERICAN INDUSTRY

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In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

come to mean to thousands whose blindness interferes with their employment. (There are approximately 270,000 blind Americans, fourteen or fifteen thousand of whom live in Ohio.)

The Timken Roller Bearing Company, which uses the gauge in the final inspection stage of its precision manufacturing, is the first industrial employer in Ohio—and one of the first in the United States—to employ blind persons. At present, more than fifty partially or totally blind people are employed in various operations at Timken plants in Canton, Columbus, Zanesville, Mt. Vernon, Wooster, and Newton Falls, Ohio.

During the demonstration of the gauge, a Company spokesman announced that manufacturing details of the device—developed by Timken engineers so that the Company could give re-employment of Timken veterans—will be released without charge to any interested manufacturer.

◆

MEMORIAL CLUBHOUSE PRESENTED BY JEFFREY FAMILY TO LEGIONNAIRES

The cover of the May issue of "Jeffrey Contact," publication of The Jeffrey Manufacturing Company, Columbus, Ohio, carries a photograph of the new home of Jeffrey Legionnaires. Formal dedication ceremonies of this memorial clubhouse were held on Sunday, June 3rd.

The Malcolm D. Jeffrey Post No. 465 is named for the late Malcolm D. "Jack" Jeffrey, brother of Mr. Robert H. Jeffrey, chairman of the board, and the new clubhouse is a gift of the Jeffrey family.

◆

STANDARD OIL (IND.) SETS CANDLE PRODUCTION RECORD

The candle shops of Standard Oil Company of Indiana have set a production record in manufacturing candles for the Armed Forces.

In the first six months of this year the shops produced more than 75 per cent as many candles for the military as were shipped during the entire year of 1944. This was accomplished through 7 days per week, 24 hours a day operation of all molding equipment used for military candles.

The record production of military candles represented more than 65 per cent of the entire volume produced in the first half of this year by all departments of the candle shops, which are located at Standard's Whiting, Indiana, refinery.

Candles are used by the armed forces for temporary light, to warm emergency food rations, and, when melted, to stop tent leaks and for waterproof coating. Candles are included in emergency military kits.

The company stated that because of the demand for wax for the armed forces the supply of civilian candles during the balance of this year will be far less than the demand.

◆

PALMER FORMS NEW SALES AND ENGINEERING SERVICE FOR INDUSTRY IN MONTREAL

The formation of a new company specializing in sales and engineering service has been announced from Montreal, Quebec. Operating under the name of Frederick E. Palmer & Company, this enterprise has been organized by Bob Palmer who has been associated with the pulp and paper industry since 1926, covering a wide range of experience in mill construction, operation, maintenance, equipment, and pulp and paper machinery design, as well as sales of specialties to the industry.

Mr. Palmer was recently connected with the C.P.P.A. Wartime Machine Shop Board as assistant co-ordinator of production in the mainteance of machine shops of the Canadian pulp and paper mills. The accomplishments of these shops has been an outstanding contribution to the war effort.

◆

▶▶▶ TWO FIRST AWARDS from the National Advertising Agency Network at its twelfth annual competition, held recently in Washington, D. C., were given to The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., New Jersey. The first of these honors was for "Best Integrated Advertising and Merchandising Campaign." The other was for "Employee Relations Program," and covered the Company's publicity and other promotional activities dealing with employees and servicemen relations, and includes: the company's publications, victory gardens, war bond and other drives, Safety bulletins, etc.

◆

WESTINGHOUSE ENGINEER TO SERVEY ELECTRICAL INDUSTRY IN GERMANY

Charles A. Powel, newly-appointed chief of the Electrical and Radio Branch of the Allied Control Commission and president of the American Institute of Electrical Engineers, is taking leave of absence from his position of Headquarters Engineering manager for the Westinghouse Electric Corporation and will fly to Germany to assume his new post.

Mr. Powel has first-hand knowledge of the expansion of Germany's electrical industry in prewar years. His survey probably will take him to all parts of Germany where electrical equipment factories exist, including zones occupied by the British, French, and Russians, as well as the American occupied sector.

During World War I, Mr. Powel served as a member of the British War Mission to the United States and he has had extensive experience as a representative of private engineering companies in England, Switzerland, and Japan.

In the United States with the British Mission when World War I ended, Mr. Powel chose to remain in this country and become an American citizen. Joining Westinghouse, he has been successively manager of the central station engineering department, manager of the industry engineering department, and in 1941 assumed his present position.

◆

SCHOLARSHIP FUND IS SET UP BY G-E AS AN HONOR TO EX-PRES.

To assist in higher education and fundamental research work in scientific and industrial fields, a fund of $400,000 has been set aside by the directors of the General Electric Company to be known as the Gerard Swope Foundation. Mr. Swope served as president of General Electric for more than 19 years, from May, 1922, until the close of 1939, and for an additional two years in 1942-44 he returned to head the company when C. E. Wilson, now president, was acting as executive vice chairman of the War Production Board. When he resigned at the close of 1944, Mr. Swope had also served as a director of the company for more than 22 years.

The directors announced that the new foundation was created "as an expression of appreciation of Mr. Swope's great contribution as the leader and inspiration of the General Electric Company for so many years, and as a means of making this appreciation of enduring and constructive benefit to the company and to the electrical industry."

It is proposed to utilize the income of the foundation in the following ways:

In granting loans or scholarships to employees and to the children of present or former employees of the company and its affiliated companies, to help them pursue their work in any field of study and in any approved university, college, or technical school in the United States that they may select;

HARNESSING THE RAINBOW

Capturing and duplicating the most subtle shades of the rainbow is only the first step in dyestuff application.

The real problem is to harness that color—to make it do a specified job. Breaking colors to harness forms a large part of the work of color specialists of Du Pont's Laboratories. They are constantly striving not only to maintain and improve the quality of production, but also to improve application processes in the dyestuffs industry.

The result of their research is an ever growing stockpile of knowledge, which is at your disposal of paper manufacturers and other users of dyestuffs. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Delaware.

Du Pont Dyestuffs

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

DU PONT DYESTUFFS

In granting graduate fellowships to the same classifications of individuals to be used by the recipient for graduate work in industrial management, engineering, the physical sciences, and in any other scientific or industrial field;

In granting loans, scholarships, or fellowships in any of the above fields to any other person that may be deemed worthy of assistance;

And finally, in granting graduate fellowships, to make contributions to the university, college, or technical school to help in defraying the cost of equipment and material, especially needed in connection with a research project.

Applicants for loans, scholarships, and fellowships will be considered not only from the standpoint of academic attainment and financial needs, but also as to character and personal qualifications for deriving the greatest good from the continuation of their studies. The grants will be made without regard to sex, color, creed, or national origin.

It is planned to make a statement of awards under the foundation in each of the company's annual reports. Details of administration will be announced later.

◆

MONSANTO PLANS TO BUILD SANTOCEL UNIT AT BOSTON

Monsanto Chemical Company has announced that it will construct a $450,000 unit for the production of Santocel, one of the strangest and most versatile chemical products to be developed in the last generation, at its Merrimac Division plant just outside Boston.

Work on the new facility will get under way immediately, and it is expected that the new unit will be operating at full capacity by the end of the year. The War Production Board's approval of the project was based on heavy war demand for Santocel in various direct military applications.

Discovered in 1931 by a University of Illinois professor, and made available commercially by Monsanto a short time before Pearl Harbor, the powdery substance first aroused the interest of scientists because of its unusual properties as a thermal insulant. Tests showed it to be about twice as efficient as cork in slowing the transmission of heat.

A number of new applications, some of them wholly unrelated to thermal efficiency, have been developed during the war. Included, for illustration, are the use of Santocel in printing inks, to prevent them from pulling the nap off the paper; in raincoats to prevent stickiness; in furniture coatings to afford a desirable dull sheen, and in rubber to supply strength without carbon black's discoloring effect.

Santocel also shows great promise for postwar development in the insulating field. It is said that Santocel-insulated boxes when compared with present-day models, yield about 40 per cent greater capacity per cu. ft. of kitchen space occupied.

◆

THREE SPECIAL WELDING COURSES BEING CONDUCTED AT LINCOLN ELECTRIC CO.

Three new, specialized courses in arc welding are announced by The Lincoln Electric Company, Cleveland, Ohio, which are designed to increase the student's knowledge of the shielded arc process as applied to specific metals and structures.

The courses consist of one two-week training period to instruct enrollees in the technique of arc welding the common steel alloys and non-ferrous metals. A second course of one week's duration is devoted to instruction in welding sheet metal in thicknesses of from 12 to 20 gauge. A third, two-week course is intended to train students in the welding of pipe diameters of from 2 to 10 inches.

Those now enrolled in these post-graduate courses of instruction and who are already skilled in the welding of mild steel, represent a wide variety of industries throughout the country.

The courses are under the supervision and direction of Arthur Madson, veteran Lincoln instructor at the company's plant where a school for the training of men and women in the art of arc welding has been conducted uninterruptedly for nearly 30 years. Being the oldest school of its kind in continuous existence, it has trained over 25,000 people in this rapidly growing profession.

◆

PAISLEY PRODUCTS, INC., NOW ENLARGING ITS PLANT

Due to heavier demands for adhesives to meet the overseas packaging requirements of the Armed Forces, Paisley Products, Inc., Chicago, is enlarging and modernizing its four-story and basement factory.

Exterior improvements include new shipping and loading docks and concrete driveway on vacant property, recently purchased adjoining the plant. Interior improvements cover an enlarged container filling department, shipping office and locker rooms. A separate loading and unloading dock for empty steel drums is provided.

The company's postwar plans include expansion of the packaging adhesive line.

◆

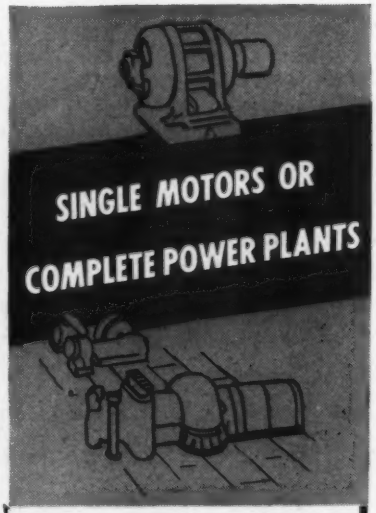
▶▶▶ FIVE STARS are now displayed on the Army-Navy "E" flag of Farrel-Birmingham Company. The award includes the company's plants at Ansonia and Derby (Conn.) and Buffalo (New York).

◆

GOODRICH CHEMICAL CO. CREATES NEW DIVISION

A new division of activity for the promotion and sale of thermo-setting resins has been created by The B. F. Goodrich Chemical Company, Cleveland. Sam L. Brous has been appointed sales manager. He already has assumed his new duties. Previously, Mr. Brous was manager of technical service.

With the B. F. Goodrich Company, parent company of the chemical organization since 1929, Mr. Brous started with the chemical research staff and was one of the trio who developed plasticized polyvinyl chloride materials, of which Geon resins, made and marketed by the chemical company, are among the most prominent.



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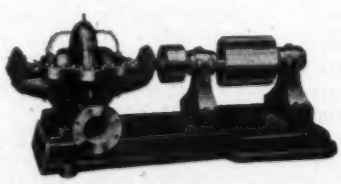
FOR A NEW WORLD OF WATER

PEERLESS now produces HORIZONTAL as well as Vertical pumps

With the recent acquisition of Dayton-Dowd Company, PEERLESS now can supply a pump for any need, including SPLIT-CASE horizontal centrifugals. Vertical and horizontal types are made in capacities from 10 to 220,000 gallons per minute.

If you are planning to "step up" your water supply, consult with PEERLESS. You will benefit by new PEERLESS developments... increased precision, improved designs, enlarged engineering service.



PEERLESS PUMPS

PEERLESS PUMP DIVISION
Food Machinery Corp.

FACTORIES
LOS ANGELES 31, CALIFORNIA
301 West Avenue Twenty-six
QUINCY, ILL. • CANTON 6, OHIO

LOW COST Rust Prevention!

USE HARPER NON-FERROUS AND STAINLESS FASTENINGS

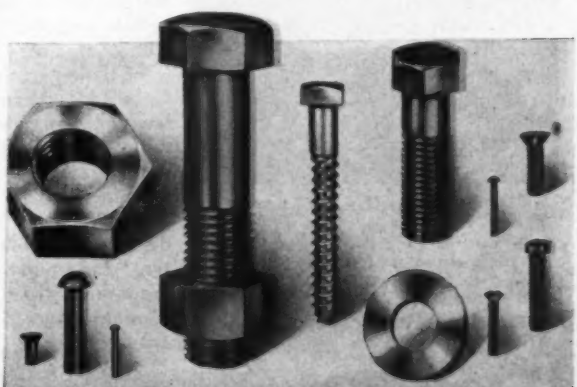
Rust is the Great Destroyer. Every year it causes damage of "war debt" proportions.

Fortunately, the cost of preventing rust and corrosion through the use of Harper Everlasting Fastenings is low. Of course, the first cost of a bronze bolt or a stainless screw is more than a comparable fastening made of common steel. Yet the difference in price is small, particularly when considered in relation to the total cost of a machine, instrument or other fastened assembly. Everlasting fastenings add longer service life to your product...and the ability to perform under tough conditions. Such qualities provide a big advantage over competition.

4360 ITEMS IN STOCK

Harper is known as "Headquarters for Non-Ferrous and Stainless Fastenings" . . . carries large and complete stocks of 4360 different items and is continually adding others . . . maintains large stocks of metals in bars, rods, wire, sheet and other basic forms from which special fastenings can be quickly made. Write for 1945 Catalog.

THE H. M. HARPER COMPANY
2647 Fletcher Street • Chicago 18, Illinois
BRANCH OFFICES:
New York City . Philadelphia . Los Angeles . Milwaukee . Cincinnati . Houston
Representatives in Principal Cities



HARPER
EVERLASTING FASTENINGS

BRASS • BRONZES • COPPER
MONEL • STAINLESS

ASSOCIATIONS

CHANGES IN CONSTITUTION OF AMER. STANDARDS ASS'N

The American Standards Association has made some changes in its constitution that will enable it to meet more fully the needs of government and industry in the postwar period. The national trade, technical, and governmental groups that make up the American Standards Association have ratified these changes, the principal one of which will remove present restrictions limiting the work of ASA "to those fields in which engineering methods apply" so that the organization can in future handle any standard or standardization project which is in the field of engineering or consumer goods or in any other field which deserves national recognition.

Another change provides for specific mention of the consensus principle in the constitution. This principle—that all groups with an interest in a particular standard have a right to a voice in its development—has always been basic in ASA operations. It seemed wise to place additional emphasis upon it by incorporating it in the Constitution, thus assuring cooperating bodies that the work will be carried out in accordance with their desires.

A third change provides for election to the board of directors of three members-at-large. At present all but the ex-officio members of the Board are nominated in rotation by the member-bodies. The additional members-at-large will make it possible to enlist the services of outstanding persons from groups not otherwise represented, thus making the board still more broadly representative.

In making these changes in the constitution of the American Standards Association, the national trade, technical, and governmental groups that constitute its basic membership restated their belief that the central force of the standardization movement should continue to spring from the organized industrial, professional and consumer groups with the full cooperation of the governmental agencies concerned.

◆

▶▶▶ COMMENTING ON the transportation problem, the American Paper and Pulp Association states in its weekly "News Summary" that the rapid tightening of restrictions on movements of passenger traffic can be expected to be paralleled by restrictions of movements of freight cars. Freight car shortages may prove a serious bottleneck in the movement of imported pulp from ocean ports to the interior, as a cargo of 3,000 tons would require approximately 100 cars for transshipment.

◆

NO RADICAL UPSWING IN PAPER PRODUCTION EXPECTED

In a release dated July 19, E. W. Tinker, executive secretary of the American Paper and Pulp Association, states that it is *not* expected there will be any sudden increase in United States paper production resulting from the resumption of deliveries of pulp to this country by Swedish pulp manufacturers. Several factors which will operate against a radical upswing of paper production are:

1) The industry is already operating at a high ratio of production to capacity using domestic and Canadian pulp. The paper manufacturers are operating at about 90 per cent of estimated capacity and the paperboard manufacturers' rate is over 95 per cent.

2) Domestic pulpwood receipts and inventories are precariously low in some regions, especially the important Northeastern region.

3) Pulp inventories are dangerously low and will absorb several hundred thousand tons of pulp before they can be called normal.

4) It will take some time for an appreciable volume of Swedish pulp to reach this country with presently available transportation facilities.

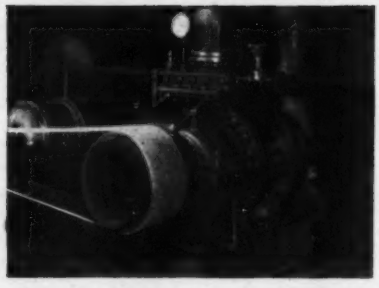
5) Shortages of other non-fibrous raw materials are threatened. Rosin size is critical at the moment and may become dangerously short unless satisfactory substitutes are developed.

6) The labor shortage in the mills and in the woods has by no means been overcome. The threatened withdrawal of German prisoners of war from wood harvesting next fall poses a real problem, especially in the great Southern paper industry.

7) Increased pulp supplies when available may be required to restore prewar bases of weight without increasing the yardage made.

"These are some of the problems which face this industry," Mr. Tinker said. "The amazing resourcefulness of the American paper manufacturers has surprised many, and this resourcefulness has by no means deserted them. But, in my opinion, it is asking the impossible to expect restoration of prewar qualities and a continuous rate of production at 100 per cent of capacity to result immediately upon the arrival of a few boatloads of Scandinavian pulp."

OUTSTANDING For . . . . SUSTAINED EFFICIENCY



Above photo shows an "R-C" Rotary Positive Vacuum Pump connected to press roll and operating at 15" vacuum, 660 CFM, 1,050 RPM. "R-C" units are made in sizes for producing vacuums up to 25" Hg.

Wear has been practically eliminated in the Roots-Connersville Positive Displacement Vacuum Pump because there is no contact between the impellers and the casing. High volumetric efficiency is practically constant during extra-long life.

Consistent performance under variable vacuums makes them especially suited for service where different grades and weights of paper are manufactured on the same machine. "R-C" Vacuum Pumps are not harmed by small quantities of liquid passing thru the pumps. Simple design, rugged construction, and finest workmanship assure outstanding performance.

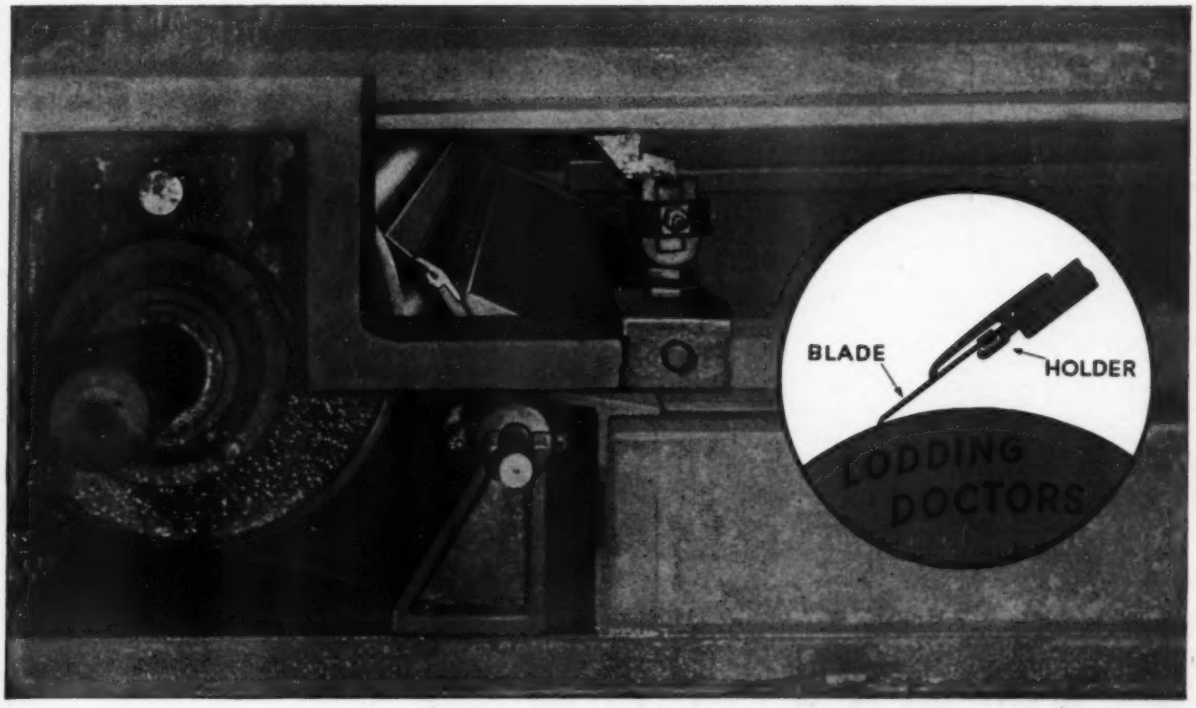
A copy of Bulletin 50-B-12 will interest you.

Roots CONNERSVILLE SINCE 1854

ROOTS-CONNERSVILLE BLOWER CORP.
One of the Dresser Industries
508 Monroe Avenue Connersville, Indiana

Improved Moderate Speed VACUUM PUMPS

New machine buyers are specifying Lodding Doctors as original equipment



BREAST ROLLS kept clean and bright by correct, continuous doctoring—means no wrinkled wires or scored rolls. LODDING DOCTORS—floating blade—give you maximum flexibility because the blade conforms itself to the roll surface with minimum pressure.

LODDING FLOATING BLADE DOCTORS—light, sturdy, non-vibrating, non-sagging. LODDING patented streamline brass blade holder, eliminates buckling because the blade is permitted to expand under all operating conditions . . . takes blade .015 to 1/8" thick. Low operating angle—better fit, longer wear, no chattering. One full inch of blade wear. Complete change in less than one minute.

LODDING ENGINEERING CORPORATION
WORCESTER, MASSACHUSETTS, U. S. A.

Represented outside of New England by

W. E. GREENE CORPORATION
Woolworth Building NEW YORK

PULP and PAPER MILL ACCESSORIES, Ltd., 2023 Aylmer Street, MONTREAL, QUEBEC

S A F E T Y

SIXTEEN SAFETY AWARDS WON BY S. O. CO. (IND.)

In recognition of the safety records they set in producing 100-octane aviation gasoline, toluene for TNT, and other petroleum products for the Armed Forces, employees of the Whiting, Indiana, refinery of Standard Oil Company of Indiana have received 16 safety awards from the American Petroleum institute. Employees in the utilities department of the company's refinery at Sugar Creek, Missouri, also received an award.

Each award recognized success in preventing accidents in a different department for 1,000,000 or more man-hours of work without loss of time or disabling injury. Eleven of the total 17 safety records remain intact and are subject to additional awards for every increase of 1,000,000 man-hours without accident or at any time should an accident occur.

Of the 16 Whiting awards, the one for the most man-hours worked without disabling injury was presented to employees of the pressure stills department with a record of 5,476,776 man hours covering 11 years 6 months. The award for the longest period of time went to the Whiting engineering department whose employees worked 25 years 3 months in accumulating a safety record of 3,245,000 man hours. Whiting filling racks employees worked 19 years 1 month for a safety record of 1,407,912 man hours, Sugar Creek utilities department employees 17 years for 1,046,791 man hours, and Whiting electrical department employees 16 years 7 months for 2,251,867 man hours.

The first safety department in the petroleum industry was established by Standard of Indiana at its Whiting refinery in 1918.

SAFETY CONTEST SCORES

The annual contest among mills in the Paper and Pulp Section of the National Safety Council closed June 30.

Due to the fact that all reports must be in before final scores can be published, additional time is needed to figure scores following the close of the contest. Therefore, the final scoces, as of June 30, were not ready when this issue went to press.

Watch this section for closing figures on the contest.

◆

NSC COMMITTEE DRAWS PLANS TO TAKE THE PLACE OF CONGRESS

Because the 1945 National Safety Congress has been canceled, the National Safety Council has appointed a Committee to develop a plan for Sectional and Council reports which will, in a sense, take the place of the Congress. This Committee consists of Walter S. Paine, chairman of the Conference of Sections; R. J. Reigeluth, chairman of the Executive Board; W. Dean Keefer, chairman of the Congress Committee; and Ned H. Dearborn, president.

Highlighting the plans prepared by this Committee are the following:

Publications: (1) Special annual news letters, (2) printed annual report of the Council, (3) contest pamphlet. (This will be a printed pamphlet listing the winners of awards in the Council's Sectional Contests, as well as other award winners. It will be distributed to all interested members.

General Sectional Meetings: Meetings of the different Sections to be held in certain localities has been discussed. The feasibility of such meetings should be determined by a consideration of the Section involved and the transportation situation in the area. In the present circumstances, it seems this part of the plan could only be effective in metropolitan areas. Care should be exercised to conform with O.D.T. requirements.

Sectional Elections: The selection tion of Sectional Officers and Executive Committees for the year 1945-1946. Each Section, under authority granted by the Executive Board, may keep its present officers for another year, if desired. Otherwise, a letter ballot may be conducted for the selection of new officers.

◆

▶▶▶ APPROXIMATELY 220 participants have enrolled in the contest for 1945-1946 among mills in the Paper and Pulp Section of the National Safety Council. The contest began July 1st and will run for one year. Results from the former contest will soon be available.

WHERE DECAY, ODOR, TASTE, OR ACID IS A PROBLEM, USE

Tidewater RED CYPRESS

Read What Authorities Say About Its Superior Qualities

Romeyn Beck Hough, author of "American Woods", says of Cypress "Its great durability, immunity from the attacks of parasites, and non-liability to great shrinking or warping make it one of our most valuable woods for all woodwork exposed to weather, for tank construction, cooperage, etc. Its value . . . is enhanced by its comparative freedom from coloring or flavoring ingredients".

Phillips A. Hayward, author of the volume on Wood in Chandler Cyclopedia, says that Cypress is "easy to work, available in large dimensions, and resistant to decay". It is also "resistant to changes in moisture, resistant to acids, and imparts neither color nor taste."

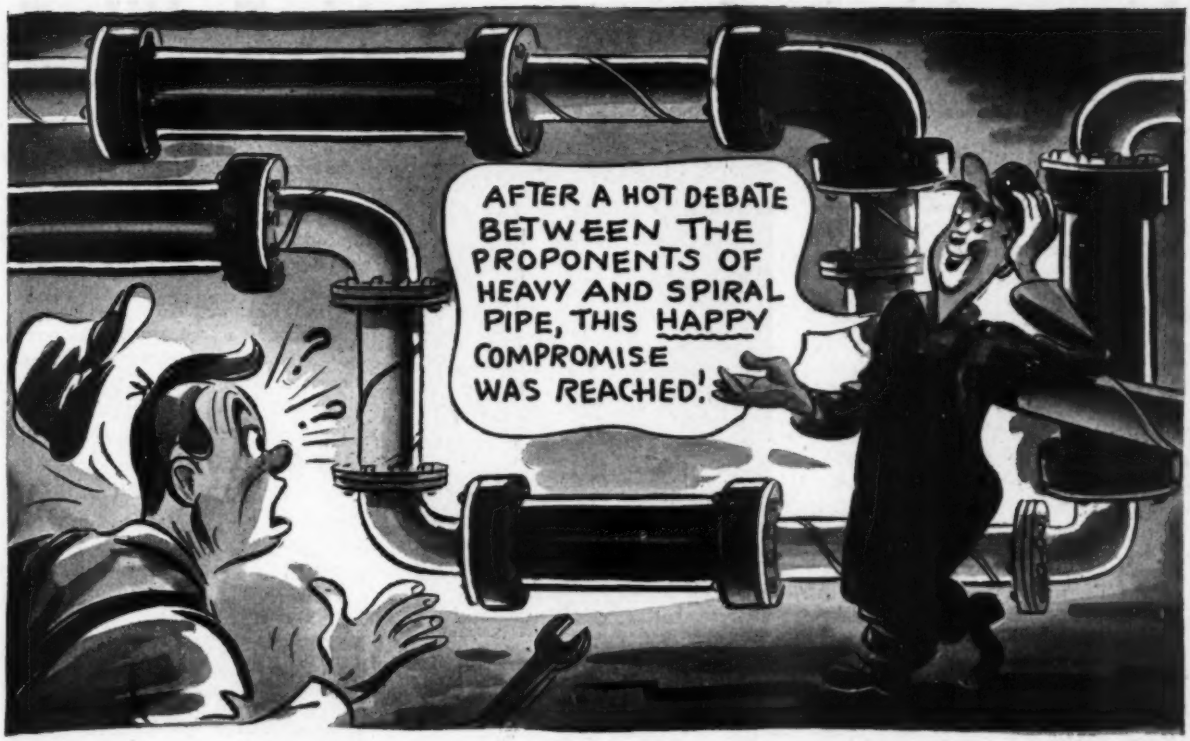
For a hundred industrial needs, TIDEWATER Red Cypress is the right answer. Write today for full details.

Tidewater RED CYPRESS

Tidewater Red Cypress "The Wood Eternal"

FLEISHEL LUMBER CO.

4234 DUNCAN AVE. • ST. LOUIS 10, MO. • NEWSTEAD 2100



It's better to go all the way with Taylor Spiral

IF you take your run-of-plant piping too lightly, the pipe you use is apt to be too heavy . . . which is simply a trick way of saying: When you get down to brass tacks Taylor Spiral will take care of a large percentage of your everyday piping needs.

Perhaps you consider Taylor Spiral Pipe only for those special applications that it handles so much better than any other type of pipe. That's fine as far as it goes. But why let it obscure the fact that light-but-strong Taylor Spiral can also handle ordinary piping services like those listed below just as well as Standard Thickness pipe . . . and at a much lower cost?

Taylor Spiral Pipe does the work of heavier pipe because its spiral reinforced construction gives it a remarkably high strength-to-weight ratio—gives it greater bursting strength, greater collapsing strength, greater longitudinal stiffness than any other type of pipe.

Its light weight saves you dollars at every turn—in first cost, in transportation cost, in erection and handling cost, in cost of supporting structures. In many cases it reduces the installed cost of piping to half that of the Standard Thickness pipe it so well replaces.

Switching to Taylor Spiral Pipe for services like those listed is made easy by the complete range of sizes and wide variety of fittings. Thicknesses range from 12 to 6 gauge; sizes from 6" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies are produced by Taylor Forge & Pipe Works, assuring complete service and undivided responsibility.

TAYLOR FORGE & PIPE WORKS

General Offices & Works: Chicago, P. O. Box 485 ★ New York Office: 50 Church St. ★ Philadelphia Office: Broad Street Station Bldg.

CHANGE TO TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- White Water Lines
- Pulp Stock Lines
- Paper Stock Lines
- Alkaline Lines
- Size Lines
- Swing Pipe
- Spray Pond Piping

NAMES *in the* NEWS

Personals

THOMAS LEECH MADE VICE PRES. AND SALES MGR. OF WHITING-PLOVER PAPER CO.

The election of Thomas Leech as vice president and his appointment as sales manager has been announced by the Whiting-Plover Paper Company, Stevens Point, Wisconsin.

Mr. Leech has been associated with the company since 1938. After a short period in the advertising and sales promotion department, he became engaged primarily in general sales work, serving a wide territory throughout

Thomas Leech

the South and Middle Eastern sections of the country.

At a special stockholders' meeting on July 9, Mr. Leech was named a director of the company, as was A. J. Schierl, who is secretary and assistant general manager.

◆

WALSH TO MANAGE PAPER CHEMICALS DEPARTMENT OF AMERICAN CYANAMID

The appointment of J. M. Walsh, as manager of the Paper Chemicals Department of the American Cyanamid & Chemical Corporation has been announced. Mr. Walsh has been associated with the company for many years and is well known in the paper industry.

J. D. Lowery, who was formerly

J. M. Walsh

manager of the combined Heavy and Paper Chemicals Departments, has been appointed assistant general sales manager of the Corporation, and will also continue as manager of the Heavy Chemicals Department.

◆

FRANK J. FOLEY LEAVES BLANDIN PAPER—NOW WITH ROCKWELL-BARNES, CHICAGO

The addition of Frank J. Foley to its executive staff has been announced by the Rockwell-Barnes Company, of Chicago. Mr. Foley, who had been sales manager for the Blandin Paper Company, Grand Rapids, Minnesota,

Frank J. Foley

has a wide acquaintance in the paper industry. Mr. Foley will be responsible for mill contacts and development work to improve quality and maintain grade standards of paper which the Rockwell-Barnes Company converts.

The Rockwell-Barnes Company manufactures a complete line of boxed and wrapped fine papers, rolls, and converted paper specialties, including office specialties.

◆

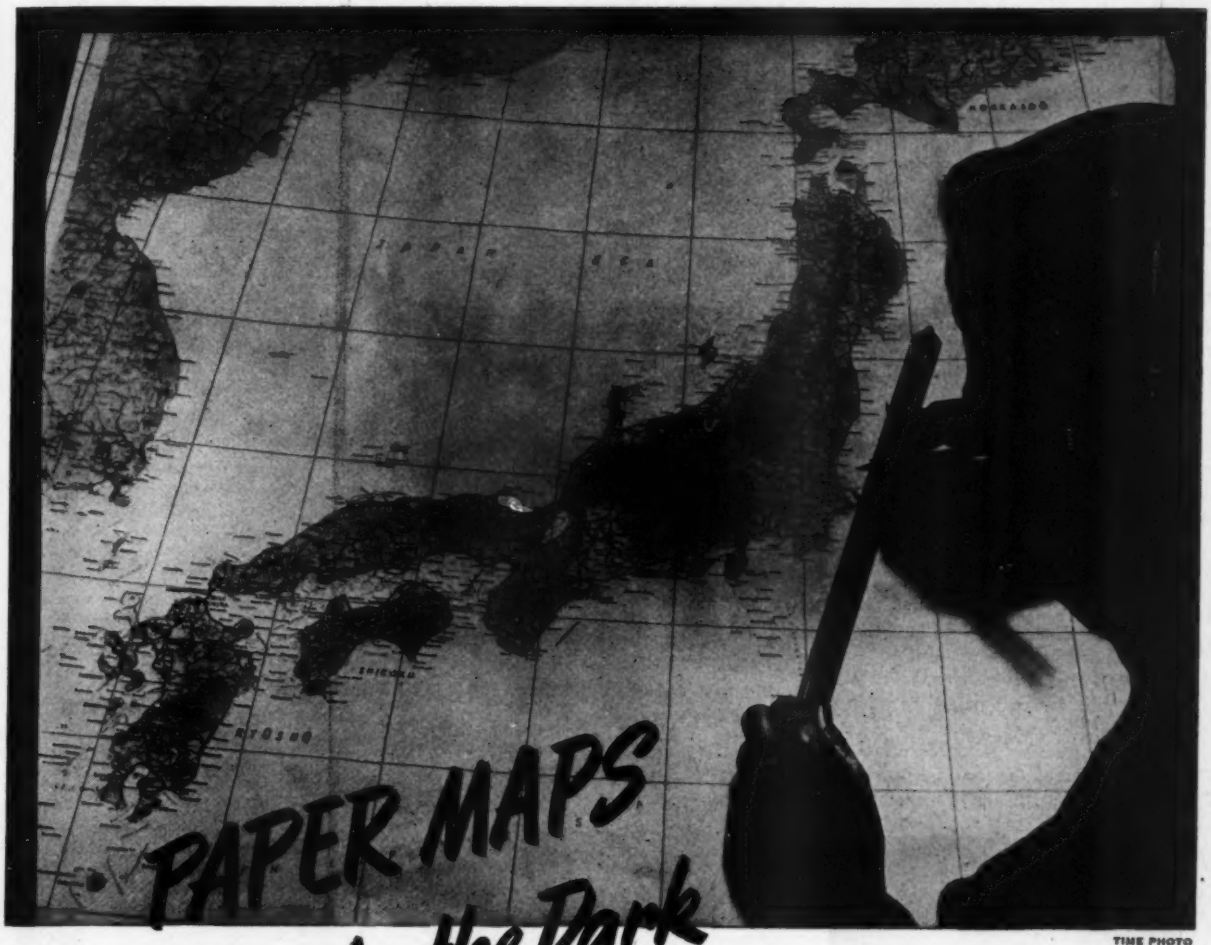
FRED SEYBOLD JOINS E. P. LAWSON COMPANY

The E. P. Lawson Company announces the appointment of Fred W. Seybold as chief designing engineer for the production of paper cutting

Fred W. Seybold

machinery that will be offered under the Lawson trademark.

Mr. Seybold, an outstanding authority in this field, became interested in machine design when he went to work in 1916 for his uncle, Charles Seybold, the founder of the Seybold Machine Company. He is a graduate of Ohio State University and holds the degree of Bachelor of Mechanical Engineering, and in 1933 the professional degree of Mechanical Engineer was conferred upon him by his alma mater. In 1934, Mr. Seybold accepted the appointment of chief engineer for American Type Founders, Inc., and until his recent resignation to join Lawson, was engaged in the design of printing machinery at Elizabeth, New Jersey.



TIME PHOTO

GUIDE NIGHT-FIGHTING FORCES

Paratroopers swiftly, silently landing in the dark, amphibious forces staging surprise night attacks—they must know where they are, what is ahead and around them—but no merest glimmer of light must reveal their secret presence. How are they guided? By ingenious maps that glow in the dark! Luminous maps guided victorious invaders across the Rhine and up the beaches of Okinawa. They lead victorious troops on night attacks that baffle the enemy, achieve quick advances.

Maps—hundreds of millions of maps—have been indispensable in the prosecution of the war. And newly developed map papers have been among the essential paper industry's greatest contributions to victory.

KENWOOD WOOL PRODUCTS

SAVE WASTE PAPER

F. C. Huyck & Sons is proud to be serving an industry so essential to the war program. Our skill, our facilities and our 75 years of experience are always available in solving the special felt problems created by urgent wartime paper needs.

F. C. HUYCK & SONS

Kenwood Mills

Albany New York

1870 SEVENTY-FIFTH ANNIVERSARY 1945

The E. P. Lawson Company has sold and serviced thousands of paper cutting machines during the past 47 years, and according to David W. Schulkind, president of the company, they are at present engaged in tooling-up for the production of Lawson paper cutters. The lifting of the War Production Board's strict controls on basic materials will enable the Lawson company to carry out its comprehensive manufacturing plans. While there will be no immediate flood of high grade steel for civilian consumption it is understood that sufficient materials, plant capacities and manpower are available to carry forward the production of Lawson paper cutting equipment.

◆

GLIDDEN CO. ANNOUNCES TWO PERSONNEL CHANGES

Two important personnel changes have been announced by The Glidden Company, Cleveland, with the statement that these changes have been necessitated by the company's growth.

W. J. O'Brien, vice president, who has been in general charge of manufacturing, becomes chairman of the company's Research and Manufacturing Committee, and assumes administrative charge of the Chemical and

W. J. O'Brien

Pigment Division, including plants at St. Helena, Maryland, Collinsville, Illinois, and Oakland, California. He will also have administration over Metals Refining Company Division, Hammond, Ind.; the Euston Lead plant, Scranton, Pennsylvania; the Naval Stores Division, principal plants in Jacksonville, Florida, and Valdosta, Georgia, and the company's mining interests.

P. E. Sprague, who has been vice

P. A. Sprague

president in charge of sales for the Chemical and Pigment and Soya Products Divisions, becomes vice president in charge of administration of the Soya Products Division, Chicago, and the Feed Mill Division, Indianapolis.

◆

PERSONNEL CHANGES ARE ANNOUNCED BY RELIANCE ELEC. & ENGINEERING CO.

Two promotions in top personnel of the Reliance Electric & Engineering Company, Cleveland, have been announced.

Fred E. Harrell, chief engineer for the past two years, has been appointed general works manager, succeeding S. B. Taylor, who has resigned as manufacturing vice president but will remain a member of the board of directors.

Fred E. Harrell

William R. Hough, product development engineer, has been named chief engineer, succeeding Harrell.

For a year prior to his appointment in 1943 as chief engineer, Mr. Harrell served with marked success as executive director of Reliance's new Marine Division plant. Due to wartime demands on the company's engineering staff, he was recalled to the engineering department. Mr. Hough joined Reliance in 1929, following his graduation in electrical engineering from the University of Michigan.

Announcement also was made of the election of *A. S. Knoizen,* of Franklin, Pennsylvania, as a director, to replace *John D. Fackler,* who resigned as a member of the board, but remains as legal counsel. Mr. Knoizen is executive vice president of Joy Manufacturing Company and the Sullivan Machinery Company, and director of the Mining Division of the War Production Board.

◆

MANDO APPOINTS FURLONG DIR. OF PUBLIC RELATIONS

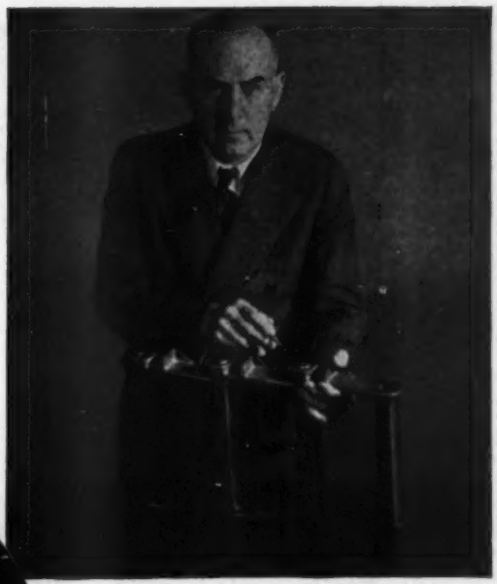
The appointment of L. A. Furlong, of Minneapolis, as director of public relations was announced recently by Donald D. Davis, president of Minne-

L. A. Furlong

sota and Ontario Paper Company. For the past 12 years Mr. Furlong has been director of publisher newsprint sales for the company.

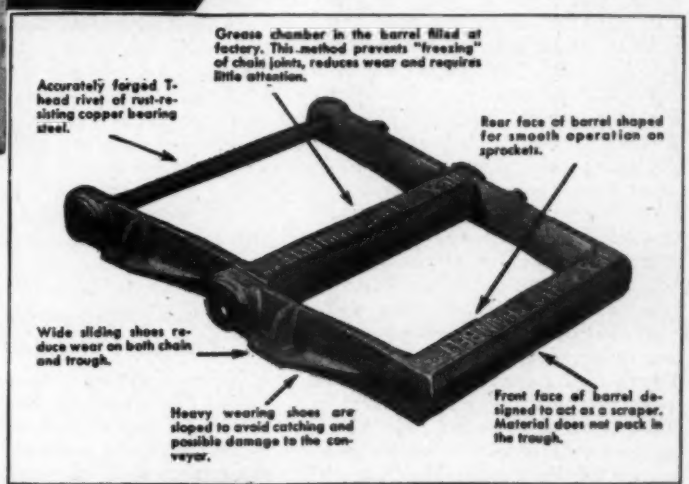
Mr. Furlong also is known for his activities as chairman of Minnesota Forest Industries Committee, which he assumed in 1943. In addition, he is a member of the executive committee of the Keep Minnesota Green organization set up by Governor Edward J. Thye in May, 1944. Before taking

This Refuse Conveyor carries *All* the Load!



① IT'S BUILT FOR BIG CAPACITY, this husky Rex H-Type refuse conveyor chain . . . capacity plus the ability to handle all the load. The flat face of the outer barrel is designed to act as a scraper and avoids any tendency to ride over the material.

② TAKE THIS REFUSE CONVEYOR, for example. Two strands of Rex H-type conveyor chain operate side by side in an inclined trough . . . there's no tendency here for the chain to override material. Every piece is carried to its destination. Wide wearing shoes, cast on the side bars, protect the chain from the abrasive sliding action of operation in troughs and runways . . . materially prolong chain life. Where service is exceptionally severe, the chain is furnished in Rex Z-Metal . . . the ductile ferrous metal that is considerably more resistant to abrasion and corrosion than standard malleable iron.


Grease chamber in the barrel filled at factory. This method prevents "freezing" of chain joints, reduces wear and requires little attention.
Accurately forged T-head rivet of rust-resisting copper bearing steel.
Rear face of barrel shaped for smooth operation on sprockets.
Wide sliding shoes reduce wear on both chain and trough.
Heavy wearing shoes are sloped to avoid catching and possible damage to the conveyor.
Front face of barrel designed to act as a scraper. Material does not pack in the trough.

③ REX H-TYPE CONVEYOR CHAINS have other equally important design advantages for lumber mill service. Links are ideally designed one-piece castings. Inner barrel faces are rounded for good sprocket action. T-head rivets are locked into the side bars to prevent their turning. A vertical lug reinforces and protects the side bar and the rivet head.

* * *

Rex H-Type conveyor chain belts are the answer to many lumber mill refuse conveyor problems. The Rex Man can help you with your chain belt application problems. For engineering data, write for your copy of the 768-page catalog, No. 444. Chain Belt Company, 1714 W. Bruce St., Milwaukee 4, Wis.

REX **CHAIN BELTS**

Manufactured in every available type for the positive transmission of power, timing of operations and conveying of materials

CHAIN BELT COMPANY OF MILWAUKEE

West Coast Offices: Los Angeles . . . San Francisco . . . Seattle . . . Portland

over the handling of publisher newsprint sales for Mando, Mr. Furlong was connected with the National Pole and Treating Company, an affiliated company of Mando.

◆

FRANCIS W. PLOWMAN ELECTED A VICE PRESIDENT OF SCOTT PAPER COMPANY

An announcement has been made by the Scott Paper Company, Chester, Pennsylvania, of the election of Francis W. Plowman to a vice presidency in the company. Mr. Plowman has been general sales manager and a director, and he will continue to head the distribution activities of the company.

Associated with the Scott Paper Company since 1928, Mr. Plowman has a broad knowledge of the business, and has promulgated many of the company's current sales plans and policies. He has served as a director of the Tissue Association for several years.

◆

CHAS. V. MORRIS MAKES NEW TRADE CONNECTION

Announcement has been made by Harry E. Gould, president, Reinhold-Gould, Inc., New York City, that Charles V. Morris has been named as director of trade relations for the company. Morris is well known as a paper sales executive, author and editor of Graphic Arts publications. He has a background of 16 years in paper sales activities and more than three years as creator and producer of printing, lithography and photogravure.

For the past three years, Mr. Morris has been associated with William E. Rudge's Sons, New York printers and publishers, as assistant to the president, production chief and finally as promotion executive for the National Association of Manufacturers. Mr. Morris was former secretary, sales manager and member of the board of directors of J. E. Linde Paper Company, and editor of *Linde Lines*, which was thrice winner of the International Direct Mail Advertising Association's award for outstanding achievement in house organ development. Mr. Morris has been credited with creation and direction of the "Linde Line Clinics" which were considered noteworthy contributions to the welfare of the entire Graphic Arts Industries.

Mr. Morris was one of the founders of the Graphic Arts Victory Committee. He is editor of the "Guide to Wartime Printing and Lithography," and other publications, as well as being the author of many trade paper articles. In addition, he has been active in paper trade association work.

PRESIDENT OF OLIVER UNITED FILTERS GIVEN HONORARY DEGREE LL.D.

At the commencement exercises of the University of California on June 23rd, the degree of Doctor of Laws (LL.D.) was conferred upon Edwin Letts Oliver, president of Oliver United Filters, Inc.

The citation accompanying the award reads:

"Graduate of our College of Mining in the class of 1900; noted for his invention of the filter bearing his name, valued for its utility in Metal-

Edwin Letts Oliver

lurgy, chemistry, and general industrial fields; one whose activities have been carried on not only in the United States but in other lands as well; a loyal alumnus of the University, devoted to its well being, man of far-flung interests, resting on the foundation of his own inventive genius."

This degree is a fitting award to a man who has contributed so much to industrial progress.

◆

NORMA-HOFFMANN REPORTS CHANGES IN SALES ORGAN.

Norma-Hoffmann Bearings Corporation (Stamford, Connecticut) announces a recent adjustment in the Home Office sales executive personnel, consequent upon the resignation of Carl W. Hedler as Western sales manager and manager of distributors' sales. In line with the firm's established policy, which fosters the advancement of personnel from within its own organization, the following appointments became effective July 1, 1945:

R. L. Miller, sales manager

E. M. Beers, Jr., assistant sales manager

G. V. Titsworth, assistant sales manager

C. L. Brown, Jr., assistant to the sales manager

W. G. Sargent, manager of distributors' sales

The foregoing sales executives will continue to report to Frederick W. Mesinger, vice president in charge of sales.

◆

DETROIT SULPHITE PULP & PAPER CO. APPOINTS DR. LARSON AS TECH. DIR.

The Detroit Sulphite Pulp & Paper Company, Detroit, announces the appointment of Dr. Leslie L. Larson to the position of technical director. Dr. Larson is a 1934 graduate of the University of Idaho, and also a graduate of the Institute of Paper Chemistry, where he received his Ph.D. in 1940.

He was formerly employed by Kimberly-Clark Corporation as research chemist. Later, he was with the Edgewood Arsenal in the same capacity.

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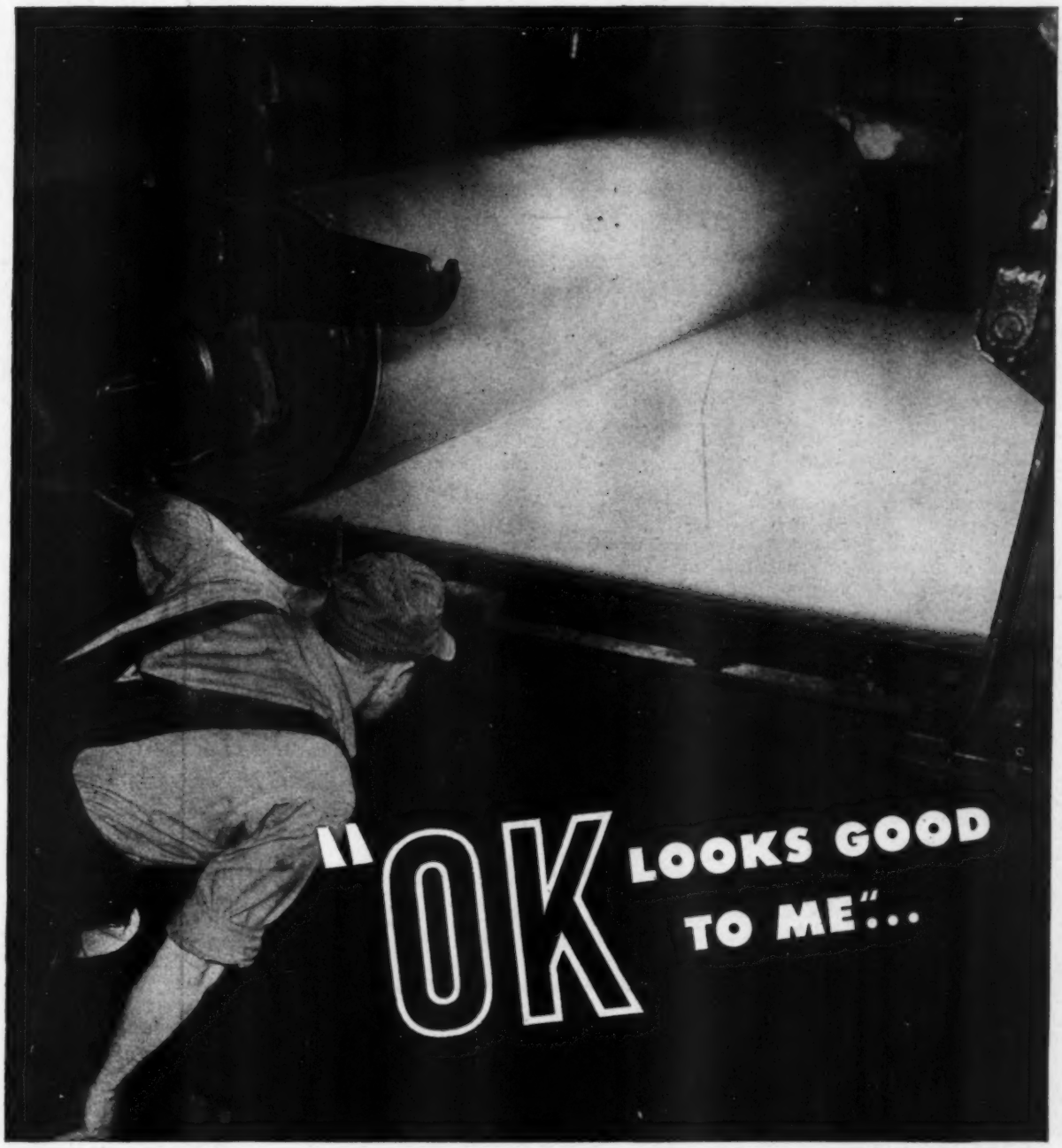
▶▶▶ Former works manager of the Holyoke (Mass.) plant of Worthington Pump and Machinery Corporation, Harrison, New Jersey, *Harry A. Feldbush,* has been named vice president in charge of engineering for the entire corporation. His duties cover engineering activities of all works and domestic subsidiary companies. His headquarters will be at the general offices in Harrison. *Ralph M. Watson,* formerly chief engineer of the centrifugal engineering division, has been appointed assistant to Mr. Feldbush.

◆

DR. SHIRLEY NOW ASST. DEAN OF NEW YORK STATE COLLEGE OF FORESTRY

Announcement of the appointment of Dr. Hardy L. Shirley, director of the Northeastern Forest Experiment Station, U. S. Forest Service, Philadelphia, as assistant dean of the New York State College of Forestry at Syracuse University, was made recently by Dr. Joseph S. Illick, acting dean of the College. Dr. Shirley will take up his duties at the College September 1. The appointment is the result of an extensive canvass of available men by the Board of Trustees to fill the vacancy caused by the resignation of Assistant Dean Clyde Leavitt November 1, 1943.

Dr. Shirley was born in Orleans, Indiana, November 20, 1900. He was graduated from the Orleans high school and received the B.A. degree from Indiana University in 1922, and Ph.D. from Yale University in 1928. Dr. Shirley taught in the high school



THIS particular couch roll is attracting wide interest and attention. It is the first of many synthetic rubber rolls to be installed in one of the nation's largest board mills.

Recently the machine tender told us that the roll has just the right degree of resilience and is doing a fine job.

This mill is particularly proud of a record which has put it among the top producers of paper board this year.

We are no less proud of the contributions United States Rubber Company engineers have made in developing exactly the right compound for the specific job.

Serving Through Science

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE · ROCKEFELLER CENTER · NEW YORK 20, N. Y.

at Kendallville, Indiana, was assistant professor in mathematics, University of Nevada; instructor in dendrology and mensuration, Yale School of Forestry; assistant in biochemistry, Boyce-Thompson Institute, Yonkers, and senior silviculturist at the Lake States Forest Experiment Station, U. S. Forest Service. October 16, 1939, he became Director of the Allegheny Forest Experiment Station with headquarters at Philadelphia, and May 1, 1945, succeeded to the directorship of the renamed Northeastern Forest Experiment Station.

Dr. Shirley was sent on a special mission to Europe by the U. S. Forest Service and the Oberlander Trust to study forest tree seed testing and seed certification in 1935. This was followed by a special mission in 1937 to Puerto Rico, Virgin Islands and Trinidad to study the need for forest research in tropical America, and to outline a program for such research. The establishment of the Tropical Forest Experiment Station in 1939 followed the recommendations made by Dr. Shirley at the conclusion of his survey.

He is a member of 14 scientific and professional societies among which are the Council of the Society of American Foresters and the Executive Board of the Pennsylvania Foresty Association; also Phi Beta Kappa and the Society of Sigma Xi. Dr. Shirley is author of some forty reports and special articles. Among his later publications are special reports on opportunities in forestry, and forestry in the postwar world.

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▶▶▶ *C. Gordon Biesenthal,* who has had a wide experience in the paper industry, has joined Alexander Fleck, Limited, of Ottawa, Canada, as chief engineer. Mr. Biesenthal has been associated with a number of companies including Canadian International Paper Company, Spruce Falls Power & Paper Company, J. R. Booth, Limited, and The E. B. Eddy Company.

◆

DR. STINE RETIRES FROM ACTIVE DUTY WITH DU PONT

Announcement has been made of the retirement of Dr. Charles M. A. Stine as a member of the Executive Committee of the E. I. du Pont de Nemours Company, also as advisor on research and development. He will retain his position of vice president and director.

Dr. Stine was connected with the company for 38 years, rising from a minor research position to chemical director. He was director of research work in the central Chemical Department of the company when such important developments were achieved as the synthetic resins for "Dux" and "Dulux" finishes. For many years he has also been a consultant to the Chemical Welfare Service. He will be succeeded by Roger Williams, assistant general manager of the Explosives Department, who will assume the duties of advisor on research and development.

◆

CHAS. BUTCHER NOW WITH CROCKER-WHEELER DIVISION

Charles A. Butcher, formerly manager of the Pacific Coast Manufacturing and Repair Department of Westinghouse Electric Corporation, has been appointed assistant general manager of the Crocker-Wheeler Division, Joshua Hendy Iron Works, Ampere, New Jersey. Mr. Butcher has been associated with Westinghouse in various capacities.

Charles A. Butcher

A graduate of Iowa State College, Mr. Butcher is a fellow member of the American Institute of Electrical Engineers, and the author of several articles on automatic controls for power generation and on substation and distribution equipment. He is also the inventor of a number of devices and control systems related to automatic switch gear.

◆

▶▶▶ The appointment of *Allen B. Stiles* as manager of the Philadelphia and Baltimore territory is announced by The Wm. Powell Company, Cincinnati, Ohio. Mr. Stiles, whose office is at 1520 Locust Street, Philadelphia 2, is well known throughout the eastern section of the country, having represented the Crane Company for the past several years.

▶▶▶ The resignation of *Christopher C. Crucius,* engineering and sales director of The Bagley & Sewall Company, Inc., Watertown, New York, has been announced. Mr. Crucius has taken a similar position with Lyddon & Company, New York City., exporters of pulp as well as pulp and paper machinery. Mr. Crucius has been with Bagley & Sewall since May, 1944. Previously he was associated with Crown-Zellerbach Company, Crown-Willamette Paper Company, and the Cliff Paper Company. No successor has yet been named.

◆

▶▶▶ *Harry R. Clarage,* chairman of the board of directors of the Clarage Fan Company, Kalamazoo, Michigan, was elected president at a recent meeting of the board of directors. He succeeds the late Roland R. Ware, president of the company since May, 1943, and general manager for the past 15 years. *Robert A. Wasson,* vice president, was named general manager, and was placed on the board of directors.

◆

M. C. McDONALD IS NOW PRES. OF CHESAPEAKE CORP.

The Board of Directors of The Chesapeake Corporation of Virginia, West Point, Virginia, announces the satisfactory consummation of plans involving changes respecting the corporation's officials, such changes to be effective September 1, 1945.

Elis Olsson, who has been associated with the management of the corporation since its organization, and who, since 1929, has been president and general manager, has been elevated to the newly created position of chairman of the Corporation.

Under Mr. Olsson the corporation has become one of the outstanding manufacturers of sulphate pulp, fourdrinier kraft liner and kraft specialties in this country. Mr. Olsson will continue active in the guidance of the affairs of the corporation.

M. C. McDonald, of Monroe, Louisiana, succeeds Mr. Olsson as president.

Mr. McDonald has been connected, in various capacities, with The Brown Paper Mill Company, Incorporated, of Monroe, Louisiana, for the past twenty-two years. Starting as resident engineer on construction, he was advanced to the office of assistant manager and plant engineer. In March, 1932, Mr. McDonald was made vice president and general manager of the company, which position he has held to the present time. Previously, Mr. McDonald was connected for four years with George F. Hardy, outstanding consulting engineers in the paper industry. Mr. McDonald attended the

Something New

IN CAST STEEL — GLOBE *and* ANGLE VALVES

IT WILL pay you to look into the complete line of OIC Cast Steel Valves . . . for they *are* different.

You will find a RIGHT OIC Valve for every application with the right combination of trims to give you the best performance.

Take, for example, the OIC Cast Steel Globe and Angle Valves that assure you greater dependability and greater flexibility . . . positive and accurate flow control . . . maximum performance . . . longer trouble-free operating life.

These great OIC Valves are completely described in our new brochure No. 357.

Why not send today for this brochure and get the inside story of the superior service these valves will render?

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Send me copies new OIC Brochure No. 357 on OIC Cast Steel Globe and Angle Valves . . . also name of OIC Distributor nearest to me.

Name .....

Company .....

Address .....

City..... State.....

THE OHIO INJECTOR COMPANY
WADSWORTH, OHIO
Quality Leaders in Valve Manufacture Since 1883

engineering school of the Unitersity of Michigan and served in World War I as an Ensign in the United States Naval Reserve.

Mr. Olsson stated to the board that he considered the corporation "most fortunate in obtaining the services, as president, of a man of such recognized ability."

The other officers of the corporation, remaining unchanged, are: W. C. Gouldman, vice president-secretary; J. P. Ekberg, vice president; O. D. Dennis, treasurer; and E. S. Gray, assistant secretary.

◆

NEW APPOINTMENTS MADE BY LINK-BELT COMPANY

The Link-Belt Company, Chicago, has announced the following appointments:

A. C. Fellinger has been made sales manager, power transmission machinery, with headquarters at the company's Ewart plant in Indianapolis. Mr. Fellinger succeeds the late C. Walter Spalding. He has had a wide experience in the field of power transmission, having joined the Link-Belt organization at Indianapolis in 1916.

The sale and application of Link-Belt silent chain drives will hereafter be headed by H. F. R. Weber, divisional sales manager, silent chain drives, with headquarters at the Ewart plant in Indianapolis. Mr. Weber started his Link-Belt career at the company's Philadelphia plant in 1915 as a power transmission engineer. He last held the position of central division manager for power transmission machinery with headquarters in Chicago.

G. H. Woody continues as sales manager of the ball and roller bearing division with heaquarters at the Indianapolis plant.

Sales through Link-Belt distributors will be supervised by F. A. Hurd, divisional sales manager, industrial distributor sales, Chicago; G. H. Unruh, divisional sales manager, industrial distributor sales, Philadelphia; and Harry Reisser, divisional sales manager, automotive equipment sales, Indianapolis.

H. F. Weber

A. C. Fellinger

◆

"DON" KLETZIEN NOW WITH MARATHON—AT MENASHA

A. F. (Don) Kletzien has become associated with Marathon Corporation, Menasha, Wisconsin, where he will be in charge of the department of commercial research. His headquarters will be at Menasha.

Mr. Kletzien is widely known in the paper and bakery industries. He has been connected with the paper business for twenty-five years, the last three as general manager of Saniwax Paper Company, Kalamazoo, Michigan. Prior to that, he served as secretary-treasurer and controller of United Wallpaper Company, Chicago, and as secretary and controller of the Fox River Paper Company, Appleton, Wisconsin.

◆

▶▶▶ *Albert C. Fischer,* who has been associated with The Massillon Paper Company, Massillon, Ohio, for 32 years, has become general manager of the company. For the past five years, Mr. Fischer has been secretary of the Massillon company, which office he will retain. He also is secretary of the Munroe Falls Paper Company, Munroe Falls, Ohio.

◆

FRANCIS CURTIS ELECTED TO CHAIRMANSHIP OF THE SOC. OF CHEMICAL IND.

Friends of Francis J. Curtis, St. Louis, Missouri, vice president of Monsanto Chemical Company, will be pleased to learn of his appointment as chairman of the American Section of the Society of Chemical Industry, an English organization of industrial chemists.

Mr. Curtis, who served as vice chairman of the same committee, assumed his duties as chairman on July 1, upon his return from a British-American mission in Europe, where he inspected German chemical plants. Mr. Curtis is also vice chairman of the Division of Industrial and Engineering Chemistry, American Chemical Society, and a director of the American Institute of Chemical Engineers.

Necrology

PHILIP P. SCHNORBACH

The town of Manistee, Michigan, lost its leading industrialist when Philip P. Schnorbach passed away on July 3.

Mr. Schnorbach was president and general manager of the Filer Fibre Company, and president of the Manistee & Northeastern Railway. He was 73 years of age.

Born in the town of Muskegon (Mich.), Mr. Schnorbach grew to young manhood during the years that town was a booming lumbering town. From a city job, he became associated with a marine contracting business, then public utilities. In 1916, he became associated with Max Oberdorfer, now president of the St. Helens Pulp and Paper Company, St. Helens, Oregon. Mr. Oberdorfer was interested in a site for a pulp mill in Michigan. They engaged the interest of E. Gordon Filer (millionnaire timberman) in the idea, and the Filer Fibre Company was organized. The pulp mill furnished employment for the men who faced idleness due to the shutdown of the Filer lumber mills. Mr. Filer became president of the company, and when he passed away, Mr. Schnorbach succeeded him.

Surviving are the widow, a daughter, and two sons—Philip W., of Manistee, and Captain Wm. Leahy Schnorbach, of the U. S. Army Air Corps.

◆

ZACK PHELPS

Zack Phelps, assistant general manager of the pigments department of E. I. du Pont de Nemours and Company, Inc., passed away suddenly July 15.

Mr. Phelps became associated with the development department of the Du Pont company in 1917, in which position he remained for ten years. During that time, the department made extensive surveys and helped lay the groundwork for Du Pont's expansion from the explosives into the diversified chemicals business. Mr. Phelps filled managerial positions in several of the company's plants, and when Du Pont acquired Krebs Pigment and Chemical Company in 1929, he was elected a vice president of that company. He filled the same position when Krebs Pigment and Color Corporation was formed in 1931. When the Krebs Pigments Department of Du Pont was established in 1935, Mr. Phelps became assistant manager.

The widow and two daughters survive.

◆

CHARLES CHAMPION

The American Pulp and Paper Mill Superintendents Association added another name to its "In Memoriam" list

WORLD'S LARGEST PRODUCER OF SYNTHETIC RESINS

RCI

proving its superiority

in the world's dampest spot

THE WET-STRENGTH RESIN P-426

BECKAMINE

Although this product comes under WPB allocation, ordering is easy, and orders for most end uses are being approved. Simply fill out WPB-2945 forms stating the name of the resin (P-426 Beckamine) and the intended end use. Then send 3 copies to WPB . . . to arrive on or before the 15th of the month . . . and one to our Sales Department with your order. Shipments will be made as soon as we receive WPB approval of your order.

There could be no better proof of the efficiency of P-426 Beckamine in imparting wet-strength than its use in the production of diaper paper. And heightened wet-strength is only one result of its use. This urea-formaldehyde resin increases tensile strength, fold and mullin as well. It can be applied directly in the beater, fan pump, or head box—or directly to the sheet at the size press—and it is notable for stability in storage. Ask the RCI Sales Department at Detroit for additional details.

Saturday Evenings at 8:30 (E.W.T.)
You Will Enjoy RCI's
"Symphony of the Americas"
Via Mutual Network Stations

REICHHOLD CHEMICALS, INC.

General Offices and Main Plant, Detroit 20, Michigan

Other Plants: Brooklyn, New York • Elizabeth, New Jersey • South San Francisco, California • Tuscaloosa, Alabama • Liverpool, England • Sydney, Australia

SYNTHETIC RESINS • CHEMICAL COLORS • INDUSTRIAL PLASTICS • INDUSTRIAL CHEMICALS

when Charles Champion, one of the Association's past presidents, passed away suddenly July 9th. He was 72 years of age.

Mr. Champion was one of the bulwarks of the superintendents group. He had been associated with the papermaking industry for more than fifty years, his first connection having been with the Byron Weston Company at Dalton, Massachusetts.

At the time of his passing, Mr. Champion was production manager of the Millers Falls Paper Company, Millers Falls, Massachusetts. Previous papermaking connections included the Berkshire Hills Paper Company, Adams, Massachusetts, where he was superintendent for two decades. He also served the Parsons Paper Company in an advisory capacity.

Charles Champion

Two daughters and a son survive. The son, Charles H., Jr., is with R. T. Vanderbilt Company, Inc.

◆

DR. CARL B. THORNE

The passing of Dr. Carl B. Thorne on July 14th closed one of the most colorful careers in the papermaking industry on this continent. Dr. Thorne passed away at his home in Hawkesbury, Ontario, Canada. On July 28th he would have been 69 years of age.

Although he retired as technical director of the Canadian International Paper Company in 1944, at the time of his passing he was vice president of that company.

Born in Norway, Dr. Thorne studied both mechanical and chemical engineering at Hanover and Dresden Universities in Germany. After leaving the university, he became interested in the manufacture of sulphite pulp and worked as both chemist and engineer in sulphite mills in Germany and Norway.

In 1902, Dr. Thorne came to this continent to continue the study of paper manufacture. The following year he became associated with the Riordan Company as engineer and sulphite expert at Hawkesbury and Merritton, Ontario. In 1905, he was made manager of the Hawkesbury mill and later also took over the management of the Merritton mills.

Dr. Thorne is credited with having designed and built the first reinforced concrete towers for the manufacture of sulphurous acid. Other developments and contributions to the sulphite industry followed. More important than any perhaps is his continuous and multiple-stage bleaching systems.

Dr. Thorne had been knighted by the King of Norway for furthering Norwegian interests in Canada.

In 1938, the Technical Association of the Pulp and Paper Industry conferred upon him its gold medal "in recognition of his outstanding contribution to technical development of the pulp and paper industry.

He is survived by his widow in Hawkesbury, and a brother and sister in Norway.

We offer safe, economical solutions to all pulp and paper mill drainage problems with our twill weave, plain weave, sewed seam, and soldered seam wires.

●

International Wire Works

Menasha, Wisconsin

JOSEPH LEA FEARING

Vice president of the International Paper Company, Joseph Lea Fearing, passed away in New York City on July 28th.

From 1906 to 1923, Mr. Fearing was western sales manager for the International Paper Company in Chicago. Since then he has been in New York.

He is survived by his widow, three daughters and three sons.

◆

JACOB EDGE

Jacob Edge, vice president in charge of sales of the Downingtown Manufacturing Company, Downingtown, Pennsylvania, passed away suddenly July 24. Mr. Edge was stricken while on a fishing trip the afternoon of the 21st.

Jacob Edge

Mr. Edge's first connection with the Downingtown company was in 1910 when he began working in the sales department. Later, he became assistant sales manager, and more recently, vice president in charge of sales.

Many improvements in paper mill machinery which are now used successfully were designed by Mr. Edge.

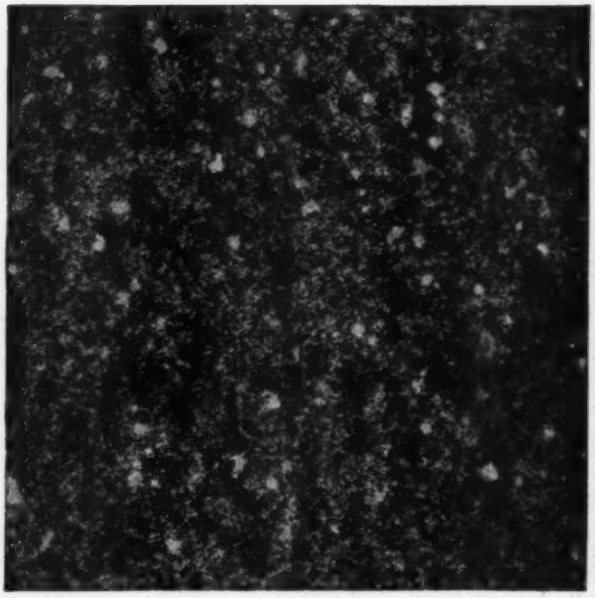
He is survived by his widow, two daughters and a son. The daughters and son are in the Service.

◆

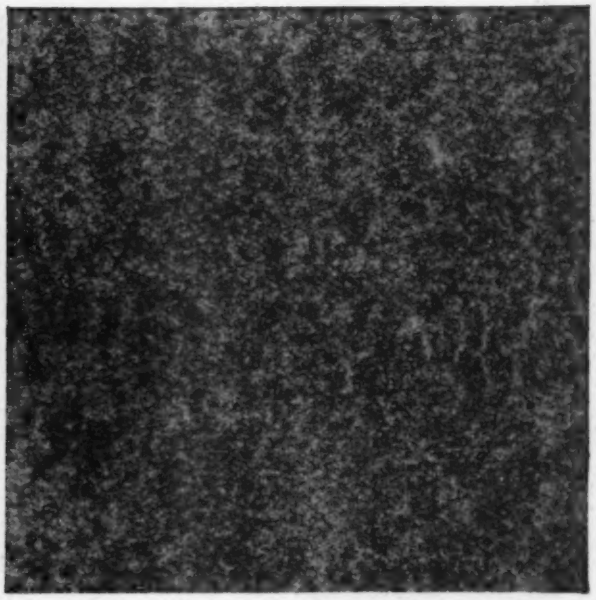
▶▶▶ Widely known among paper manufacturers of New York State and New England, *George William Stainsby* passed away July 3 at his home in Glens Falls, New York. Prior to his retirement six years ago, Mr. Stainsby was paper sales manager of Finch, Pruyn and Company, Glens Falls, with whom he was associated for 35 years. He is survived by his widow, a daughter and two sons.

THIN SPOTS 75% ELIMINATED

Micro-Photographs Show That NOPCO-KF Makes for Better Sheet Formation



• *Micro-photograph of sheet (furnish 40% sulphite and 60% soda) prior to incorporation of NOPCO-KF. Note the extremely uneven transmission of light indicating poor sheet formation.*



• *Micro-photograph showing resultant sheet after NOPCO-KF was added to the fan pump of the paper machine (absolutely the only furnish change). Uniform formation is shown by even distribution of light and dark area.*

BY using NOPCO-KF at various stages of the pulp and paper manufacturing processes, leading paper and paper board mills are able both to improve quality and increase production. The reason — better fibre dispersion and foam control. NOPCO-KF — a super "bubble-buster" — practically eliminates obstinate foam in a few minutes. Even when operating at capacity, entrained air — the common cause of thin spots — is dissipated as if the stock were being handled at slower speeds. That's because NOPCO-KF keeps "*working*" *even on the wire.*

A "Specific" for Better Sheet Formation

Reduced breaks — improved surface characteristics — conservation of valuable paper-making material — increased water repellency — saving of pigment in heavily pigmented paper — these are additional reasons why NOPCO-KF — a chemical substance expressly formulated to aid sheet formation — assures more and uniformly finer paper even at increased machine speeds. See for yourself. Order enough for a trial run. Write, wire or phone.

NATIONAL OIL PRODUCTS COMPANY
Harrison, N. J. Branches: Boston, Chicago, Cedartown, Ga., Richmond, Calif.

NOPCO-KF

NOPCO EVOLVED THRU RESEARCH

Reg. U. S. Pat. Off.

KEEP DOWN PRODUCTION COSTS

with... Tight Valves ON AIR, STEAM, AND WATER LINES

Efficient Lubrication OF BEARINGS

Fig. 1571
Air Cock
150 lb. Pressure

Fig. 123, "N-M-D"
Globe Valve
150 lb. S. P.

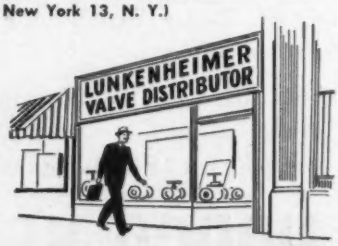
Leaky valves, permitting the escape of steam, air, or water, are wasteful in themselves—doubly wasteful in their effect on production costs and operating efficiency.

Inadequate, hand-method lubrication is another cost booster . . . increasing expense of machinery repair, of lubricant, of inspection time.

And—ultimately—*both* leaky valves and inefficient lubrication mean a *waste of fuel.*

Lunkenheimer Valves and Air Cocks have a rugged durability and simplicity of design that makes them *stay tight* with the very minimum of maintenance . . . Lunkenheimer Automatic Oilers feed the right amount of oil, in the right way, at the right time, to the right place . . . These and other Lunkenheimer products are famous for their outstanding performance record.

The Lunkenheimer Co., Cincinnati 14, Ohio, U.S.A. (Branch Offices: New York 13, Chicago 6, Boston 10, Philadelphia 7. Export Department: 318-322 Hudson St., New York 13, N. Y.)



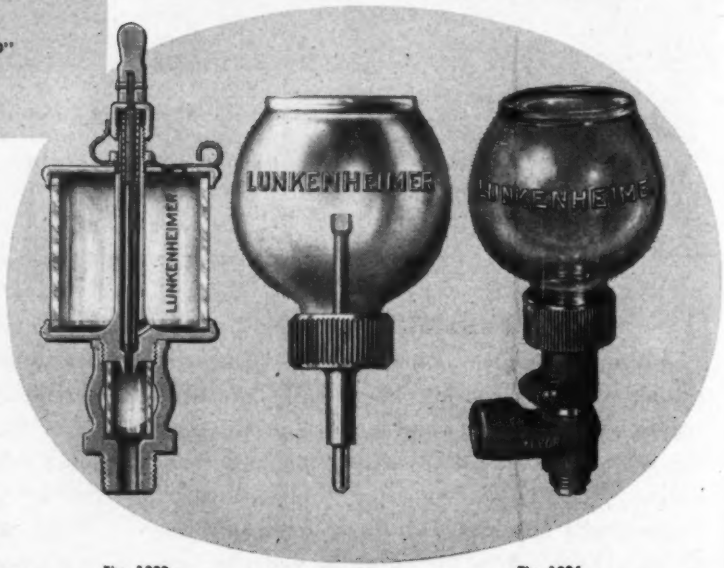


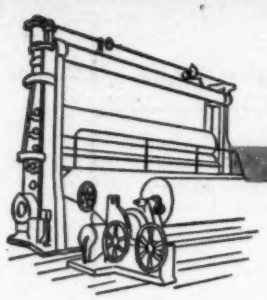
Fig. 1300
"Sentinel" Oil Cup
with Sight Feed

Fig. 1815
Bottle Oiler

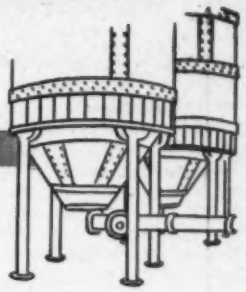
Fig. 1834
"Alvor" Constant Level
Oil Control

A Lunkenheimer Distributor is located near you, fully equipped to assist with your maintenance and operation problems. Call on him.

LUNKENHEIMER VALVES & LUBRICATING DEVICES



Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Care of Portable Electric Sanders and Grinders

Portable electric belt sanders, disc sanders and grinders are carefully designed to operate at correct speeds for maximum efficiency. Speed . . . *not pressure* . . . does the work. They perform best with firm uniform pressure, and "bearing down" only reduces the speed of the machine, slowing down the job and throwing overload on the motor.

Abrasive tools need extra cleaning because of the dust and dirt they create. Daily blowing out will remove much of this dirt and prevent accumulation, but periodic dismantling and thorough cleaning are also necessary. Since carbon and metallic dust are likely to accumulate in the commutator and brush chambers of disc sanders and grinders, be sure to connect the ground wire in order to avoid shock that might result from current carried by this dust.

Sanding Discs will last longer and keep cutting faster if washable discs are used and if they are cleaned in kerosene before they become fully clogged. Do not use a wire brush for cleaning. Keep the face of *Cup Grinding Wheels* properly dressed to eliminate chatter and insure smoother work. Avoid dropping or any other blow which might crack the wheel.

Store all *Sanding Belts* in a cool, dry place. Be sure belts are properly centered on the rollers and are installed to travel in the right direction. This prevents splitting caused by working against the glued lap. Always use the recommended type, size and grit of each *Sanding Disc, Grinding Wheel, Wire Brush, Sanding Belt or other accessory.*—SKILSAW, INC.

◆

Operation of Heat Exchangers

In starting up a heat exchanger:

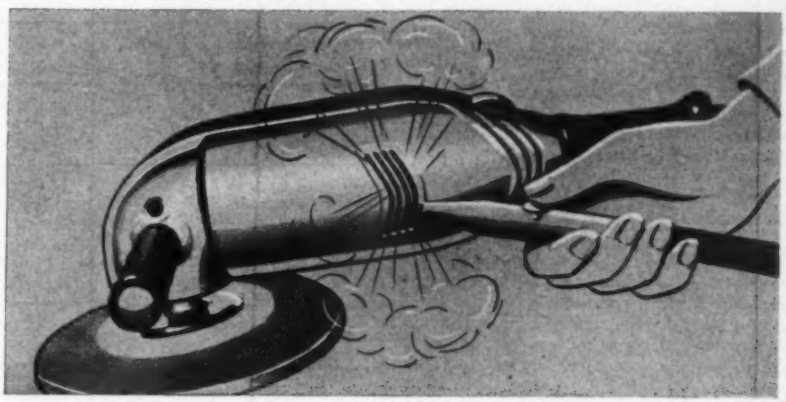
1. Be sure that all air has been eliminated from the liquid and vapor spaces by opening the vent cocks until all passages are completely filled.

2. Be sure that steam traps are properly draining the vapor space of steam actuated heaters.

3. The first fluid to admit should be that whose temperature most nearly approximates the temperature of the unit. The heat exchanger should never be shocked by the sudden admission of extremely hot or cold fluids; repeated stresses set up by such a procedure cause metal fatigue. Thermal or physical shocks should be avoided when possible.

A sufficient circulation of the cold medium should be maintained at all times to prevent overheating with subsequent depositing of scale, coke or sludge. As a general rule, in shutting down the unit, the hot fluid should be cut out first. Should it be necessary to cut out the cold fluid circulation, the hot medium should first be by-passed. After shutting down, all fluids should be drained, if possible, to prevent freezing, corrosion or sludging. In steam actuated heaters, condensate should be completely removed to prevent water hammer.

In all cases, where there is a question regarding the use of the heat exchanger for a purpose other than that for which it was designed, the manufacturer should be contacted.—THE WHITLOCK MFG. CO.



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Climbing Ladders

Most ladder accidents are caused by the ladder falling or the climber losing his balance and falling. Here are some important precautions:

1. Make sure the ladder is not defective.

2. Use a ladder with safety feet suitable for the floor or ground it stands on.

3. If the floor is extra slippery, tie the ladder at the base or have someone hold it.

4. If the ladder is placed before a doorway, lock the door or have someone guard it. Protect the ladder base from traffic, if necessary.

5. When using a stepladder, make sure it is fully extended before you climb.

6. If your shoes are muddy, or otherwise slippery, clean them before you climb.

7. Be sure the ladder is placed at a safe angle against the wall or other solid backing. An angle of about 75 degrees with the horizontal is recommended.

8. Always face the ladder and hold on with both hands, whether climbing up or down.

9. Carry tools in suitable pockets; or have tools and all other objects hoisted with rope and bucket.—*Safety Instruction Card No. 51,* NATIONAL SAFETY COUNCIL.

◆

How Should Motors Be Connected to the Machines They Drive?

The connection between the driven machine and the motor depends upon many factors, but often the success of the installation hinges upon the method of drive. In every case, the problem should be given careful consideration.

Belts are the most common means of driving machinery and are usually the cheapest. Belts have the disadvantage of being elastic and capable of stretching, which causes slipping. Slipping means loss of power and often reduces production on the driven machine. The fact that belts will slip is sometimes an advantage, however. Belts will sometimes cause trouble by coming off under jerky loads and they are not desirable for use at high speeds.

For close center drives "V" belts are used to good advantage. Because of the size and shape of the "V" belts and their clinging action to the sheaves or pulley, they can be used for fairly high ratios without slipping.

Chain belts are positive and are useful for short-center drives. They will not slip. Sometimes they are noisy, and some require considerable lubrication. There are

several types of "silent" chains specially designed to minimize noise and secure smooth running.

For high ratios, high speeds, and close quarters, gearing is generally desirable. This requires rather rigid supports for motor and driven machines, and fairly accurate alignment. The different types of gears employed with motors are: spur, herringbone, worm, spiral, helical and bevel. "Speed reducer" is the name commonly given to special-changing gear sets. They are designed to give a wide range of speeds and are housed in self-contained enclosures ready for connecting between the motor and driven machine. They are are quite widely used.

Direct drive through a flexible coupling makes the neatest and simplest installation where the motor speed is the same as that of the driven machine. Often it requires careful aligning, however.

Friction clutches and magnetic clutches are sometimes used with synchronous and other types of motors that have relatively low starting torques. The motor is first brought up to speed without load and then the load is gradually connected to it by means of the clutch. For large loads, it may be difficult to operate a friction clutch, whereas a magnetic clutch can be operated by electrical control. These clutches need direct current for their operation and with synchronous motors, this is available from the source of excitation. —*Catechism of Electrical Machinery*, FAIRBANKS, MORSE & CO.

◆

On the Starting of Felts

Many troubles of the paper mill are due entirely to improper starting-up of felts; that is, when the felt is first wet up on the machine. These troubles of stretching, narrowing, and closing up of the felt, resulting in loss of speed and production, slack streaks and short life, often do not appear until the third- or fourth-day run.

Some machine tenders claim that they are able to get a new felt on and make paper in ten minutes. These men generally have later trouble with their felts. Other machine tenders have little trouble. Both men believe that they wet up their felts properly.

Many times felts are roped up and then wet by means of a hose. It is hardly possible to thoroughly soak the felt uniformly in this manner, and unless the felt is completely and uniformly wet up, trouble will result.

This has always been a necessary characteristic of felts, and the best results can only be obtained by thorough wetting in a slack condition to insure the greatest amount of setting and toughening of the fabric. Otherwise felt troubles are bound to occur, and the felt manufacturer is then forced to supply a tougher and closer woven felt. As a result, the paper mill has sacrificed the greater water removal qualities of a more open felt as well as smoothness and ease in running.

Similarly, if the felt is put on the machine tight and then wet up, trouble will result. In this case, being already tight on the rolls, the strain of its natural shrinking will rupture or break the fibers or bond between the filling and warp threads. The felt will then lose its natural strength, which has been carefully felted in, and it will later stretch and narrow up.

To properly wet up a felt, it should be first smoothed out on the machine and run slack with water playing on it until thoroughly soaked. Being started slack and thoroughly wet up, the felt can then shorten up and widen out *as it is designed to do*. If sufficient time is taken for this starting up, the paper mill will be amply repaid in the running and life of the felt. Kenwood Bulletin No. III.—F. C. HUYCK & SONS.

Leather Belting Troubles and Reasons for Them

Troubles	*Reasons*
Ply separation	Belt too thick for the diameter of the pulleys
Leather cracked on the outside — laps opened up	Belt too thick for the diameter of the pulleys
Outside surface of belt cracked	Belt run at unnecessarily high tension
Short life of leather and cement	Belt too small for the horsepower requirements
Belt burned	Usually frictional heat caused by pulley rotating faster than belt; check adequacy of belt for starting and peak loads
Belt torn in two	Belt struck on the edge of some object or some object dropped into it. (It is a fact that a 12" heavy double requires 16,000 lbs. to break it under straight pull and only 200 lbs. to tear it. The pulleys would break before the belt would break in two.)
Pulley surface of belt checked and cracked	Frictional heat created by letting the belt slip
Belt curled and plies opened on edge	Belt run against flange; improperly placed shippers, etc.
Outside points of laps opened up	Belt running in the wrong direction
Dry rot	Acid atmospheric conditions; dressing application needed
Oil rot	Exposure to lubricating oil
Leather broken through in the endless lap	Improper cementing of the lap when the belt was installed

—GRATON & KNIGHT COMPANY

◆

Factors Affecting the Life of Refractories

The factors governing the life of a furnace lining are the design and construction of the furnace, the operating conditions, and the character of the refractories. Refractories in service are subjected to high temperatures, and usually to one or more of the following influences: abrasion; mechanical erosion; load or pressure at high temperatures; corrosion through chemical action of slags or other fluxes; chemical attack by gases; or conditions which induce spalling.

When a furnace lining fails to give satisfactory service, it is usually well worth while to review all of the governing factors. Furnace design and practice vary to such an extent that no general rules are widely applicable. However, the following suggestions may be found helpful in specific cases.

A change in furnace design in some instances, will be the most effective means of securing longer life from the refractories. This may be the case for example, when the volume of the combustion chamber is insufficient; when the walls are too thin or too high, or insufficiently supported; when the amount of insulation is excessive; when the brickwork is subjected to excessive load; or when ventilation or cooling of parts of the furnace obviously is desirable.

Brickwork which is exposed to high temperatures on two sides, without provision for ventilation or water-cooling, cannot be expected to give as long life as that which is heated from one side only.

When the life of a brick wall is shortened by the action of an impinging flame, longer life can often be secured by a redesign of the furnace or by the adjustment and control of the burners which will eliminate the "hot spot," by securing a longer flame of lower but somewhat more uniform temperature.

Proper placement of powdered coal burners is important. If the burners are improperly placed, the brickwork around the burner opening may be worn away, or slag may be deposited upon a portion of the burner opening, thereby deflecting the flame and causing other portions of the brickwork to be fluxed and eroded.

When powdered coal or oil burners are placed too close to side walls, the refractories in these walls are subjected to very severe service, due to the high temperatures and the fluxing action of the ash. Back walls should be placed far enough from burners that they are beyond the zone in which heat is being liberated most rapidly. A thin coating of a high temperature bonding mortar, which will adhere strongly to the brick, will reduce penetration by gases and by molten ash.

Operation at greatly increased furnace capacity will necessarily impose more severe service upon the refractories. A lining material which is capable of withstanding the normal furnace temperature without fusion or appreciable softening, may be badly damaged if the normal operating temperature is exceeded. Refractories in intensely heated localized areas, even though the heating be of short duration, may be damaged considerably.

Rapid changes in temperature, especially below a red heat, should be avoided to minimize spalling. This is particularly true in the use of silica, magnesite and chrome brick.

In some types of furnaces, the use of certain kinds of brick must be avoided because they cannot withstand the inherently rapid temperature changes of the operation, although they may withstand the other operating conditions better than the refractory material employed.

In a boiler setting, the life of a combustion arch can sometimes be lengthened by increasing its height above the grate.

When no single kind of refractory material is suitable for withstanding all the varying conditions prevailing in the different parts of a furnace, several different kinds of refractories are necessarily employed in the construction. Some refractories, such as fireclay and magnesite, or silica and magnesite, tend to react chemically with each other at high temperatures. Such reactions can be avoided by the use of an intermediate course of brick such as chrome which will not react with either of the other two at the temperature of operation, or by means of a joint filled with a neutral high temperature bonding mortar. In the cooler parts of the furnace, an intermediate neutral course may not be necessary.

A change in the kind of fuel, or in the nature of the charge will often cause a marked difference in the behavior of the refractory linings.

The lining materials may be damaged during the charging of a furnace. This may occur either as a result of excessive temperature change during the charging period; through bumping by charging machinery; or through the impact of large and heavy pieces of cold stock.

Damage to furnace hearths and walls is often caused by tools used for the manipulation of material placed in the furnace for heat treatment. When this is the case, the life of the refractories can sometimes be lengthened by a change in the design of the tools, or the exercise of greater care in handling them.

Hearth cleaning operations are sometimes very severe. Quenching a furnace with water to loosen scale or slag cannot fail to shorten the life of the refractories. When possible, quenching should be avoided or reduced to a minimum amount, by the use of a refractory to which the scale will not readily adhere.

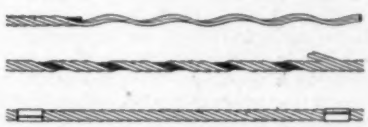
In a furnace with water-cooled parts, any water leaks which develop should be given prompt attention on account of their harmful effect upon the refractories.—MODERN REFRACTORY PRACTICE, HARBISON-WALKER REFRACTORIES CO.

◆

Rereeving a New Wire Rope

When replacing an old and worn wire rope with a new one, on any machine which requires pulling the new rope through blocks, over sheaves and on to drums—here is an idea that will save both time and temper.

From the end of the old rope, unlay and remove four of the six strands to a distance of about two or three feet. Similarly remove two of the six strands from the new rope to be installed.



Splice, or more properly speaking "lay" the two together and tape the ends to prevent unravelling. This will permit the new cable to be pulled through block and pulleys and reeved rapidly, accurately and easily.

This procedure, of course, can be followed only with preformed wire rope, since it is only that type of wire rope with strands which will lie inert. To remove the seizing wires and attempt this procedure with non-preformed wire rope would be courting trouble, since ordinary wire rope, so cut, would virtually explode.—R. B. WILLIAMS.

◆

Operating and Maintenance Suggestions for Supercalenders

The following operating and maintenance suggestions are offered as an aid to better and more efficient supercalender operation:

(1) When a new roll is put into a stack, always put it in the top position.

(2) Check the rolls occasionally to be sure that the hardest one is in the bottom position.

(3) When breaking in or reconditioning rolls, always finish off at a higher pressure than will be used when running the paper.

(4) When conditioning rolls to run out marks, use plenty of pressure or nothing will be accomplished. (The best way to get rid of marks is to shut down stack and keep hot poultices on marks overnight. Poultices should be changed every half hour during the night. Then, in the morning, the marks should run out fairly easily.)

(5) Roll temperature should not exceed 180 Fahr. and when up to this temperature or over, the stack, especially the bottom roll, will have to be watched more carefully. If the temperature runs up to 200 Fahr., sponge the roll once an hour, or twice an hour if necessary, using alcohol and water.

(6) Never use excessive pressure to operate. Try to get gloss with steam, if possible.

(7) When surface of roll begins to turn brown and freckled, it should be sanded off and reconditioned.

(8) Never place two new rolls in twin position in middle of stack unless these two rolls have been turned down and finished off because one old roll and one new one will soon cause trouble.—William R. Stapley, THE PAPER INDUSTRY AND PAPER WORLD, 23, No. 8 (November, 1941.)

◆

Maintenance of Heat Exchanger

Since the successful operation and life of a heat exchanger is influenced by the care you give it, a system for periodic inspection should be set up. Temperatures and pressures of the fluid entering and leaving the equipment should be checked as they provide reliable indications as to correct functioning. For instance, an increase in the pressure drop across the unit with an accompanying decrease in the temperature range usually indicates fouling or dirt in the unit, or a decrease in the temperature range by itself denotes vapor or gas binding. Periodic removal of the bundle for visual inspection and cleaning is desirable. The bundle should be checked for excessive corrosion. Examination and cleaning are even more necessary when the fluids handled are fouling or highly corrosive.—THE WHITLOCK MFG. CO.

◆

Origin of Leather U Packings

The principle of the hydraulic press was discovered by Sterinus about 1646, and in 1796, one hundred and fifty years later, Joseph Bramah, an English engineer, made use of the principle, probably for the first time in any practical way.

Bramah had a great deal of trouble with leakage around the plunger of his press, and to overcome this he invented the leather "U" packing, which for many years was called a Bramah collar.

Leather cup packings and flange packings were no doubt developed later as they are described in works as early as 1820 by various scientific writers on the subject of hydrostatics and hydromechanics.

The early presses were, of course, simple, push-up displacement plunger with the recesses cast in the neck of the cylinder, near the top. We are still using this principle in modern shop equipment and while the leather U packing today is made more perfectly and plungers are finished more smoothy the principle remains the same—CHICAGO BELTING CO.

How to Build Labor Productivity

JOHN D. CORRIGAN
Corrigan, Osburne & Wells, Inc.

▶▶▶ LABOR AND management have shown great interest recently in those factors which concern wages, the efficiency and productivity of labor as a basis for postwar prosperity.

We have heard much about job evaluation and wage incentive plans as an answer to the problems of production. Both labor and management believe that it will be difficult or impossible to reduce rates when our production pace slackens, also, when overtime hours are cut it will increase the pressure for higher hourly rates to offset partially the loss of overtime.

If prices and volume decline after the war, it will become economically impossible to pay the rates now paid for the work done. There is, apparently, only one solution which has been proved and worked out in industry over a period of forty years, and that is to increase efficiency and productivity to the point where improved results will justify the wages paid.

There are many ways in which management is able to contribute to this result in its own plants. Although several plans are outlined to obtain increased labor productivity, it's up to management to decide what plan best suits his particular organization for, as yet, no one has developed a plan which can be used by all plants in spite of claims made for systems which in a great many cases are similar to the claims and cure-all of a patent medicine.

A job evaluation or wage incentive system that is not engineered to the particular needs of a plant will not give results.

It has been definitely proven that 90 per cent of all labor trouble in a plant is the direct result of some petty grievance. Therefore, management's first step to increase labor productivity is to eliminate their main source of grievance, which can be done by proper wage administration.

The basis of proper wage administration is job evaluation. We are now in the middle of a labor era in which job description and analysis is essential and necessary in the writing of contracts and in the handling of wage grievances. These things are so highly important today that a comparatively new management technique has been put into operation under the title of "Job Evaluation." In addition, the government wage stabilization procedures and policies call for rate comparison on an inter-plant or area basis.

Job evaluation can be described as a scientific basis of establishing hourly rates. It's a scientific process of analytically measuring how one job compares with another in respect to the different skill, effort, responsibility and working conditions requirements. It must have as its basis a job analysis in order to determine its relative place in relation to other jobs according to the basic requirements it demands.

Job evaluation, when properly engineered, constitutes a fair and proper comparison between jobs and makes readily apparent the many values of the different jobs so that hourly rates can be applied.

Job evaluation is definitely tied up with the subject of labor productivity because sound relationships between the rates paid and different jobs encourages satisfaction on the part of the worker which is reflected in satisfactory production. Since job evaluation eliminates unfairness and inequities in the wage and salary structure, one of the most potent sources of employee discontent has been minimized.

Some plants have attempted to gain greater efficiency and productivity through the use of vacation plans, health and life insurance, glee clubs and recreational activities and facilities. These have been helpful expedients but have not cured a source of wage grievances. Sound wage administration based on scientific job evaluation will effect the cure. Furthermore, from a cold dollar and cents angle, the saving in executive and supervisory time necessary to constantly handle wage grievances is significant. This time can be directed to productive work when job evaluation is installed.

After scientific hourly rates have been established, management is then interested in obtaining standard performance of the worker. Experience has shown that where an hourly rate is paid that the efficiency of the plant tends to become that of the poorest worker. However, if a standard is set and a worker knows what his requirements are for his hourly pay and that should he exceed the standard requirement he will receive additional pay, he will become a more effective worker and the plant will exceed the standards set instead of working at 25 to 40 per cent below standards. Here again the incentive must be based on the principles and experiences acquired by industrial engineers since Frederick Taylor first established a piece rate system in 1897.

The functions of an industrial engineer is not unlike the functions of engineers in other fields. Engineering in all fields has made work and living easier than more difficult. The industrial engineer's function is to achieve better utilization of labor and machines.

The fact that a small group in management has used industrial engineering for speeding up instead of establishing fair and equitable standards has caused many workers and unions to be suspicious of management. However, as labor and progressive labor leaders become familiar with the principles of the incentive as used by management whose wage administrative policies are real, human, fair and honest, stated in fast and definite terms, they are requesting incentives as a basis of obtaining more take-home pay.

Increasing Labor Productivity with Incentives

Incentive falls into three general classifications: (1) individual, (2) group (3) combination of individual and group. The form of incentives follow three general types: piece rate, point system, or standard hour.

In the hourly rate, which is not an incentive, the individual is paid so much per hour or per day regardless of the amount of his production. This type of work puts the burden of inefficient work entirely upon management. Furthermore, it tends to encourage better workers to sink to the level of poor ones.

Recently management has probably been aware of the fact that older men in their plants are now doing poorer work than formerly because they have seen newer employees getting away with it or because they feel that they are underpaid.

Under the piece-rate system a worker is paid so much per unit of production regardless of the time it takes him. Obviously, this type encourages the worker to work as fast as possible. However, it is often discouraging to beginners who find it difficult to earn an adequate wage. It's also unfair at times in its operations as it puts the burden of improper management on the employee. Another fault of the piece rate is that it does not provide a standard to shoot at or by which to measure achievement. It is difficult to tie in with a modern type production control system which is based on time.

The point system gained so much disfavor from poor management and labor that it's rarely used today. It permitted such a complicated plan that neither management nor labor understood it and some plans required one or more industrial engineers to operate it. Since labor could not figure out its bonus under these numerous types of point systems (most of them carrying names of the man who developed them) labor has learned to distrust them.

The standard hour incentive is intended to overcome the faults of the other incentive systems. Under this type both the time rate and the piece rate are combined, a standard is set and an incentive bonus or reward is given for exceeding it so that beyond this standard the wages are increased directly with efficiency. No industrial engineer will claim that any incentive system does not have certain weaknesses. However, if they are properly installed and supervised, they will result in effectively maintaining cost standards.

The group bonus is basically paying more than one individual on the same basis as the individual bonus but where the work requires more than one employee working as a team to accomplish the results desired.

Incentives will reduce overhead by getting the work done and magnify the need for better scheduling and other management techniques to improve operations in the entire plant. An incentive's special advantage to the worker is that it makes it possible for him to actually earn a higher wage—giving value for value received.

Job evaluation and incentives may be the cure for the discontent that can be expected when the volume of work is reduced following the war.

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Heat Recovery from Digester Blowdown and Relief in Sulphate and Soda Mills

J. W. OGDEN
Foster Wheeler Corporation

There are four types of heat recovery systems that have been used for condensing digester blowdown steam and transferring the heat to wash water. Each type of system has been used successfully by sulphate or soda pulp mills. If proper care is taken in evaluating the advantages and disadvantages of each system, the mill operators should be able to select the best and least expensive type for their particular mill.

The Direct Contact System

Figure 1 consists of a direct contact condenser, water circulating pump, accumulator tank, and water regulating valves. The blow steam passes into the direct contact condenser where it is condensed by wash water pumped from the bottom of the accumulator tank. The heated water drops into the top of the accumulator tank from whence it is pumped to the washers or diffusers. The temperature of the water is maintained constant by means of a thermostatically controlled water regulating valve on the inlet line to the condenser. Cold wash water is admitted to the bottom of the accumulator tank by means of a float operated valve. The accumulator tank provides a reserve of wash water so that the condenser can be supplied with water as needed to condense the blow steam.

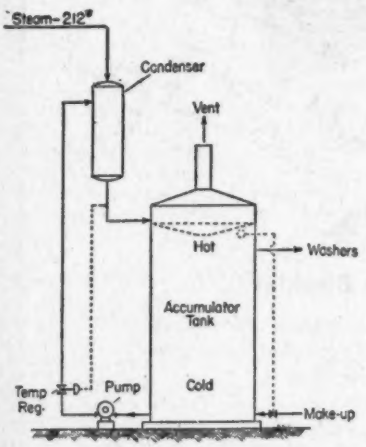

Fig. 1—Direct contact system

This type of system has four distinct advantages: (1) Simpleness of equipment and operation; (2) low first cost; (3) low maintenance since there are no heating surfaces to clean or replace; and (4) flexibility in varying wash water temperature or increasing duty.

There is one disadvantage and that is that the wash water will become contaminated to a varying degree with black liquor and odorous sulphur compounds. This fact has excluded this type of system from serious consideration in many mills. However, there is at least one soda mill and one sulphate mill that are using this method of heat recovery successfully.

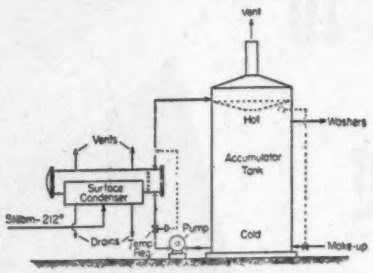

Fig. 2—Surface condenser system

In general, it is believed that this type of system might work to better advantage in soda mills where odorous sulphur compounds are not encountered.

The Surface Condenser System

Figure 2 consists of a shell and tube type of condenser with sufficient heat transfer surface to condense the peak release of steam, a water circulating pump, accumulator tank, and water regulating valves.

The blow steam passes into the condenser where it is condensed on the outside of the tubes by wash water pumped from the bottom of the accumulator through the tubes. The heated water passes to the top of the accumulator tank from whence it is taken off to the washers or diffusers. The temperature of the water is regulated by a valve on the inlet line to the condenser. Cold wash water is admitted to the bottom of the accumulator tank by means of a float operated valve.

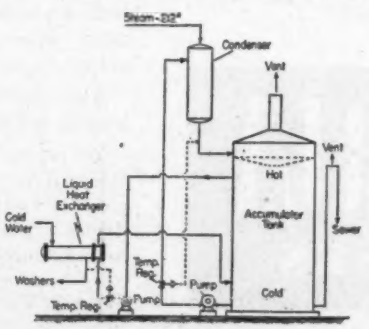

Fig. 3—Liquid to liquid system

This type of system has two advantages: (1) Simpleness of equipment; and (2) provides clean, hot wash water.

It has four disadvantages: (1) Less heat recovery since blow steam condensate will leave the condenser at about 212 Fahr. In other types, the condensate is cooled to about 125 Fahr. This difference in condensate cooling represents a loss of about 9 per cent of the heat available for recovery. (2) Tube bundle is apt to become plugged with pulp if carryover from blow system should be high. (3) If wash water contains scale forming material, the tubes will scale up rapidly. (4) If wash water contains dissolved gases, steel tubes will corrode rapidly.

Generally more care should be taken in selecting this type of system than any others. It is necessary to check the wash water requirements, the blow system and analyze the wash water before deciding.

The Liquid to Liquid System consists of a direct contact condenser, a water circulating pump, accumulator tank, condenser water regulating valve, surface type liquid to liquid heat exchanger, hot water circulating pump, and temperature control valve as shown in Figure 3.

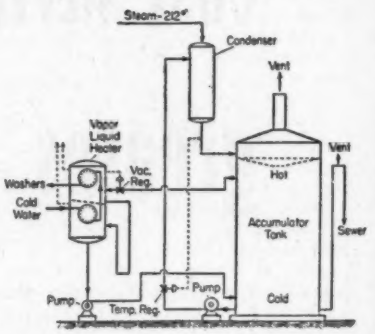

Fig. 4—Vapor to liquid system

There are two separate cycles of operation. First, the digester blow steam is condensed intermittently in the direct contact condenser. The water flow is regulated so that the water leaving the condenser is at a temperature of about 205 Fahr. The heated water passes into the top of the accumulator tank and the colder water for the condenser is pumped from the bottom similarly to the other systems. In this case, however, fresh water is not added to the accumulator and the water is recirculated over and over again. The excess water caused by steam condensate is overflowed to waste by means of a loop seal from the bottom of the tank. Second, the hot contaminated water is withdrawn at a continuous rate from the top of the accumulator and pumped through a series of surface type liquid to liquid heat exchangers. Fresh wash water passes through the other side of the heat exchangers and is heated to about 150 Fahr. The hot water is controlled by a temperature regulating valve to maintain a constant wash water temperature. The hot water is cooled to about 125 Fahr. and is returned to the bottom of the accumulator tank where it is stored for condensing the next digester blow.

This type of system has three advantages: (1) Provides clean, hot wash water; (2) requires less surface for transfer of heat than the surface condenser

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TROY, ALABAMA

Now Has a Layne Automatic Water System

City Officials of Troy, Alabama are in high spirits these days. Where all others have failed, Layne has just completed a water system WITHIN THE CITY LIMITS that produces over 1,000,000 gallons daily. Furthermore this new system is equipped with the latest automatic control device which eliminates manual starting and stopping.

Prior to the completion of this New Layne System, all water for the city of Troy was obtained from wells located some three miles away. The success achieved by Layne will now enable the city to install other wells and thus abandon the distantly located and expensive to operate system.

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LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

system; and (3) recovers more heat than the surface condenser system.

It has three disadvantages: (1) Heating surfaces are apt to become plugged with pulp, (2) heating surfaces may scale up on both sides if water is scale forming, and (3) corrosion may be experienced caused by dissolved gases if heating surfaces are made of carbon steel.

The Vapor to Liquid System consists of essentially the same items as No. 3 except that the heat exchanger is a vapor to liquid type, and in addition there are two steam jet air ejectors with a common after condenser added.

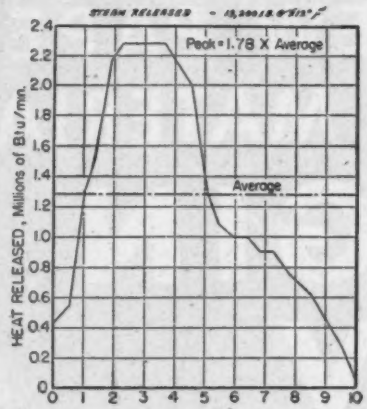

Fig. 5—Blowing time (minutes)

Digester Blow Characteristics

Digester Data

Digester Size	2200 C.F.
Blow Period	10 Min.
Blow Pressure	100 lb. Gage
Water Equivalent	99,200 lb.
Steam Released	13,200 lb. at 212 Deg. F.

Here again there are two separate cycles of operation. The first is exactly the same as No. 3. The second is different in that the heat exchanger for transferring heat is different. The hot contaminated water is withdrawn at a continuous rate from the top of the accumulator tank and passes by gravity into the first stage of the vapor heater. This stage is under a vacuum of about 19 inches mercury corresponding to about 165 Fahr. saturated temperature. The entering water being at 205 Fahr. gives up its sensible heat or flashes and the flashed vapor is condensed on a tube bundle with fresh water inside the tubes. The contaminated water passes by gravity to the second stage of the vapor heater. This stage is under a vacuum of about 26 inches mercury corresponding to about 125 Fahr. saturated temperature. The entering water being at 165 Fahr. flashes again and the resultant steam is condensed on a second tube bundle with fresh water inside the tubes. The contaminated water is removed from the bottom of the second stage by means of a pump and is returned to the bottom of the accumulator tank. Vacua are maintained by small steam jet air ejectors, one for each stage. The fresh water enters the lower tube bundle in the second stage and leaves the upper tube bundle in the first stage. Since the vapor temperature will be held constant in the first stage, the fresh water leaving this stage will be at a constant temperature.

Table I

Minimum Relief Pressure lb. gauge	Maximum Accumulator Pressure lb. gauge	Maximum Steam Pressure lb. gauge	Steam Recovered per ton of pulp
100	90	75	112
90	80	65	222
80	70	55	330
70	60	45	465
60	50	35	595
50	40	25	750

This type of system has four advantages: (1) Provides clean, hot wash, (2) requires less surface for transfer of heat than the surface condenser system, (3) recovers more heat than the surface condenser system, and (4) heating surface cannot become plugged with pulp because contaminated water does not contact the tubes.

It has two disadvantages: (1) Heating surfaces may scale up on the fresh water side if this water is scale forming, and (2) corrosion may be experienced caused by dissolved gases if heating surfaces are made of carbon steel.

The comparative costs of the four heat recovery systems running from low to high would be about as follows: (1) Direct contact, (2) liquid to liquid, (3) surface condenser, and (4) vapor to liquid. If stainless steel heating surfaces are used, the comparative costs would be about the same except that the vapor to liquid system would go into third place and the surface condenser system would go into fourth place because of the large surface required for this unit.

It must be remembered that when a digester is blown all of the recoverable heat is released in a relatively short time. Figure 5 shows the rate at which heat is released during the progress of the blow. It should be noted that the peak rate is 78 per cent greater than the average rate. Consequently in all condensing systems provision must be made to handle this peak or a loss of heat will result.

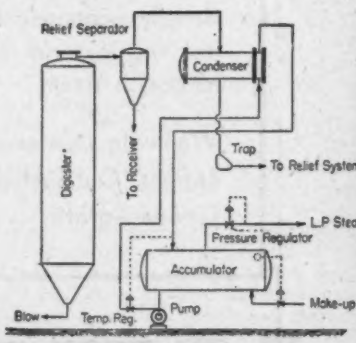

Fig. 6—Low pressure steam from relief

All of the above systems recover heat in the form of hot water, which can usually be used in sulphate and soda mills. In some cases, however, more heat is liberated than can actually be used for washing of pulp. If some of this heat could be recovered in the form of steam, greater savings would result.

Steam at pressures up to 75 pounds gage can be recovered from digester relief

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with a system as shown in Figure 6. Before blowing the digester is relieved to a pressure system through a separator and the released steam is condensed in a shell and tube type condenser where it heats water under a pressure of about 10 pounds less than the lowest point to which the digester is relieved. The heated water is stored in an accumulator vessel. It is removed at a continuous rate from the accumulator through a pressure reducing valve to the low pressure system of the mill at a pressure about 25 pounds less than the lowest relief pressure. The accumulator is required here because of the intermittent character of the relief. The drop in pressure from relief to the accumulator tank is needed for a temperature differential across the condenser. The drop in pressure from the accumulator to the low pressure system is needed so that the steam can be stored in the form of hot water. Circulating water is controlled by means of a temperature regulating valve so that the water returning to the accumulator is at a fixed predetermined temperature and pressure. Feed water is admitted as steam, is removed from the accumulator by a float operated valve.

Table 1 shows the amount of steam that can be recovered per ton of pulp produced for various relief pressures. The figures are based on a maximum digester pressure of 110 pounds gage and a water equivalent of 14,500 pounds per ton:

There will still be a considerable amount of heat left for heating wash water. Table 2 shows the amount of heat remaining in B.t.u. per ton of pulp produced for various relief pressures:

Table 2

Minimum relief pressure lb. gauge	Recoverable heat remaining—B.t.u. per ton of pulp B.t.u.
100	2,000,000
90	1,920,000
80	1,780,000
70	1,680,000
60	1,540,000
50	1,380,000

Determination of the Erasing Qualities of Paper

PHILIP W. CODWISE, Chemical Engineer, Beaver Wood Fiber Co., Ltd.

In order that a paper should be erased, it must first be written upon, either with pen and ink, pencil, or typewriter. Therefore, the determination of erasing quality in its broadest sense involves first, the erasure of characters made with water vehicle inks, and second, of those made with solid or semisolid materials, generally of an oily nature. The present investigation has confined itself to pen and ink writing. At a later date, the remaining phase will be investigated; this involves the relations of oils and solid materials to paper surfaces and requires more detailed study.

When one writes upon a sheet of paper and attempts to erase the same, a variety of things may happen. First, the writing may have penetrated so far into the surface that it cannot be erased without destroying the sheet. Second, assuming that the writing was satisfactory, the sheet may "fluff" so much during erasure as to leave a surface unsuitable for writing upon. Third, assuming the first writing and erasure to be satisfactory, the sheet may spread ink or feather when rewritten upon.

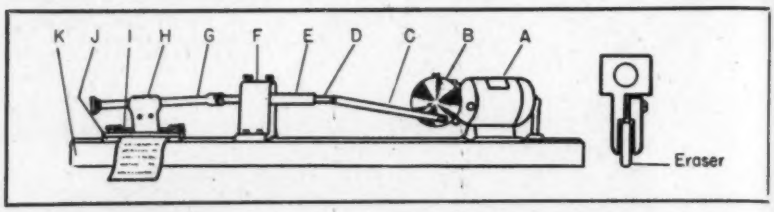

Fig. 1—Diagram of Erasure Apparatus with Detail of Eraser Holder. A. Motor—C.R. 3 Type, with Gear Ratio—144.5 to 1. B. Fly Wheel—Brass 3.25 in. Dia.—0.375 in. Thick with Eccentric Arm 1 in. from Center of Wheel. C. Eccentric Arm—8 in. Long—0.5 x 0.375 in. Steel Bar. D. Piston Rod—0.5 in. Steel Rod—8.375 in. Long. E. Piston Sleeve—0.5 in. Inside Dia. Brass Tubing—5.25 in. Long. F. Piston Support—1.75 in. Brass Bushing. G. Eraser Arm—0.625 x 0.625 Brass Rod—6.5 in. Long. H. Eraser Holder—Brass Plate—0.375 x 1.25 x 1.5 in. I. Paper Clamps—2 Brass Bars—4.75 x 0.5 x 0.1875 in. with Thumb Screws. J. Eraser Bed—Steel Plate—5 in. Dia.—0.25 in. Thick. K. Base—Wood—36 x 7 x 1 in.

In order to investigate the factors entering into pen and ink erasure, an abrading machine having a carefully controlled rubbing action was necessary. For this purpose, the one developed by the Howard Smith Paper Mills as shown in Figure 1 was used. The essentials of such a machine are: (1) a uniformly moving and controlled abrading part, (2) a clamping part to hold specimen in proper relation to the abrading action, and (3) mechanical means for performing the erasing. This has been done by fastening all parts firmly to a single base and operating them with an electric motor. Any other instrument having the required characteristcis would serve as well. However, the severity of the erasure must be carefully controlled.

The question arose as to how the tests were to be conducted to obtain the most representative results. The factors involved were:

1. The writing quality of the paper surface; in other words, the ink spread and the ink penetration.

2. The perfection of the paper surface, that is its smoothness and freedom from fuzz.

3. The amount of the paper destroyed during the erasure process.

4. The tendency of the paper to fuzz during the erasing.

5. The tendency of the ink to resist erasure and possibly to smear.

6. How much effort and time is required for the erasure process?

In other words, how quickly can the sheet be erased and how efficiently can it be done from a standpoint of fluffing and of rewriting.

Procedure

Cut a small piece (1.5 by 1.25 inch) of suitable 2/o emery cloth or equivalent with the grain the short dimension, fold it around one of the long narrow edges of a rectangular piece of Faber No. 112 rubber erasure, or equivalent rubber backing, previously cut to size, to fit the erasure head. Fit this combination into the erasure head with the abrasive cloth surface exposed, taking great care not to crack the abrasive face, as a crack tends to leave a sharp edge which would cut through the paper.

Determine the exact caliper of the specimens to be tested and cut to the proper size to fit into the bed of the erasure machine. Draw upon the specimen a cross-hatched line (|—|—|—|—|—|—|) with a drawing pen set at an opening of 0.0001 inch using Standard writing ink of following formula:

	Grams
Tannic acid	11.7
Gallic acid crystals	3.8
Ferrous sulphate	15.0
Hydrochloric acid dilute U.S.P.	12.5
Carbolic acid (phenol)	1.0
Soluble blue (Shultz No. 539; C. I. 707)	3.5

Water to make a volume of 1,000 ml. at 20C. (68 Fahr.)

Made according to directions found in TAPPI Standard T 431 m-41.

The pen is held in a perpendicular position to the surface of the paper and just enough pressure is used to draw a satisfactory line without indenting the paper.

Successful conduct of the test depends upon the proper relation of the paper and abrasive medium during the erasing process. To accomplish this, lower the erasure head with the abrasive cloth and backing loosely in place upon the rubber bed prior to inserting the specimen and hold firmly in place while tightening the screw which is designed to hold it in position.

Allow the specimen to thoroughly dry, which is generally complete in 5 minutes, and then place in the erasure machine upon the rubber apron cloth 1/16 inch thick which is used to support all samples. Lower the erasure head upon the specimen which is carefully smoothed out. Firmly tighten the screws to hold the two parallel bars upon the specimen with a firm grip and prevent any possibility of wrinkling as well as to keep the specimen flat and in perfect alignment during the progress of the test.

The specimen is so placed in the machine that a single stroke of the erasure head contacts equally all points of the design to be erased. Start the motor and determine the number of single strokes of the head required to completely erase

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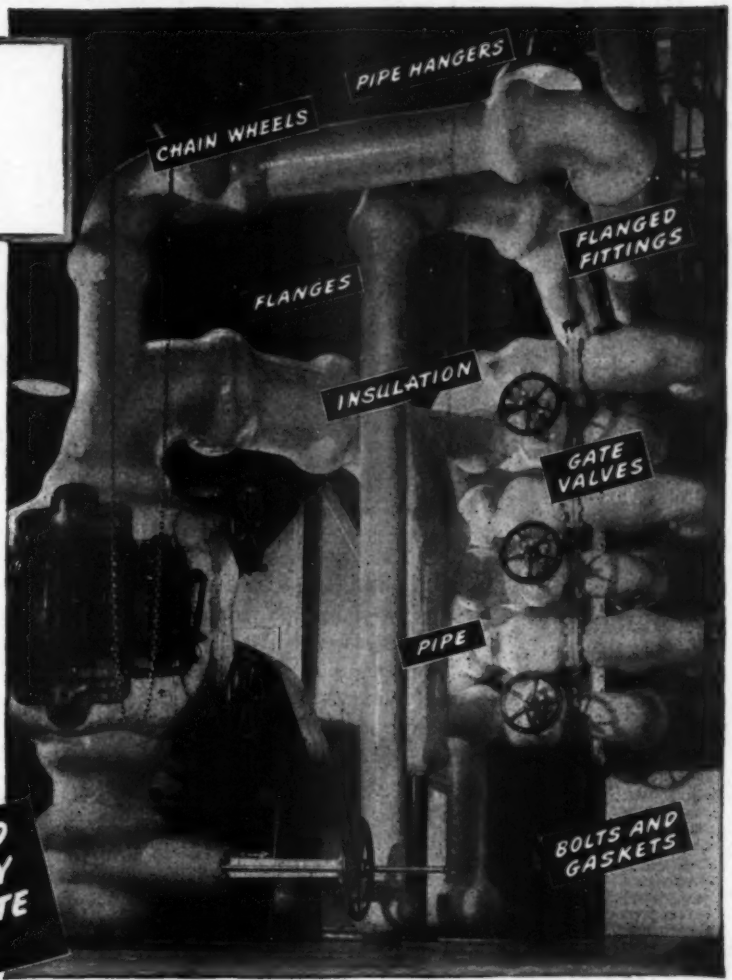

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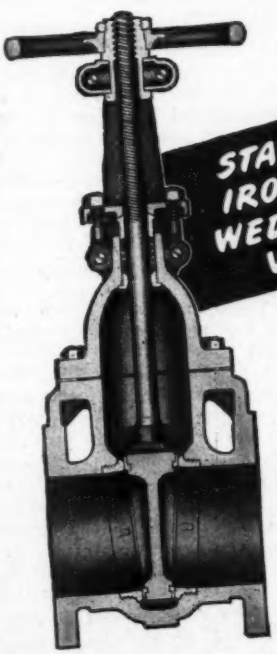

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	Saturated Steam	Cold Water, Oil or Gas, Non-Shock	Cold Water or Gas Non-Shock
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14 and 16 in.	125 pounds	150 pounds	150 pounds
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the design. During the progress of the test, note the behavior of the surface, and especially its tendency to fuzz.

Upon completion of the first erasure, remove the sample from the machine and carefully examine. Rewrite upon the specimen in an identical manner and note the difference in its writing characteristics in detail with especial attention to its tendency to feather. In the meantime, remove the abrasive cloth from the machine, discard and insert a new piece in a similar manner, carry out the second erasure in the same manner as the first one, carefully making all observations. Repeat until the specimen has been erased through.

After the last erasure has been completed and all observations made, divide the original caliper of the sheet by the number of erasures made to obtain the average thickness of stock removed per erasure.

Test Specimens

In order to show the results of this erasure test upon commercial products, five papers were selected as follows:

1. Surface sized, air dried, rag ledger
2. Surface sized, machine dried, rag content ledger
3. Surface sized, machine dried, bleached sulphite ledger
4. Surface sized, air dried, rag content bond
5. Surface sized, machine dried, rag content stationery

The samples were all satisfactory commercial products, showing no easily noted deficiencies and would normally be considered difficult to grade for erasing quality.

It is natural to expect that the harder surfaces will require more strokes to erase them but that on the other hand, relatfvely less destruction of the paper surface will occur in the process. The following critical discussion of the results shows that this is just what has occurred.

To accomplish the first erasure, it was possible on the softer surfaced sheets to do this with an average of 26 and of 24.25 strokes respectively, whereas with the hardest surfaced sheet, an average of 61.25 strokes was required. On the intermediate surfaces, 32 and 40.5 strokes respectively were required. This is of importance from the standpoint of ease of erasing the first writing. While the relation persists in subsequent erasures, the differences are not quite as pronounced.

While the ease of erasure is important, the amount of destruction of the paper surface during the erasing process and the character of the resultant writing surface is of fully as great importance.

The surface of the hardest sheet involved the smallest destruction of paper surface per erasure, namely 0.00088 inch, and gave the smallest destruction of paper per stroke, namely, 0.0000131 inch. The surface of the softest sheet involved the greatest destruction of paper surface per erasure, namely, 0.00140 inch and gave the greatest destruction of paper per stroke, namely, 0.0000411 inch. The other sheets fell into an intermediate category in each instance.

There were moderate differences in writing qualities, namely ink spread and fluff after erasure but these were slight upon the first erasure and no striking deviations were found upon subsequent erasures. Of course, the matter of ability to rewrite upon the surface is of great importance and in the case of these commercial papers it would be expected that the same would be satisfactory. A defect that may be encountered in this connection is a tendency for the ink to feather and this often depends upon the kind of ink employed. Another defect that may occur is a tendency toward fluffing during erasure which most frequently occurs when the sheet has not been sufficiently penetrated by the surface treatment. In such a case, it may give a poor erasure once the surface film has been destroyed.

In this report has been presented a standardized method of testing the erasing qualities of papers. Former methods have been highly empirical and depended too greatly on the personal factor for interpretation. It is hoped that this may form the basis of a standard testing procedure acceptable to the industry.

We wish to express our appreciation of the assistance given by the other committee members, G. H. Lafontaine and K. P. Geogehan as well as by John Watson of the author's staff. Acknowledgement is also made to the Institute of Paper Chemistry for their assistance in connection with definitions concerning the scope of this investigation.

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Map Making

WARREN C. CRUMP Asst. Head Engineer
U. S. Hydrographic Office, Navy Dept.
Washington, D. C.

The intention of this paper is to describe, generally, some of the materials, requirements, practices, and trends in the U. S. Government mapping activities with special attention to those of the Hydrographic Office, U. S. Navy. Only those items which are believed to be of interest to persons in the paper and graphic arts industries are included.

In the selection of a medium for the drawing of original survey information, the following points are of primary importance: body (thickness, grade and color), surface, erasing, quality, permanency, and dimensional change.

For many years the material used for the plotting of field surveys consisted of a 100% rag stock paper, mounted on heavy high grade muslin, stretched, and air-dried. The adhesive used for mounting these papers is specially prepared for the purpose assuring a permanent joint between paper and muslin that will not deteriorate with age.

More recently aluminum-mounted sheets have been adopted by some mapping agencies as the standard for all planetable work. The decision to adopt them was based upon the results of extensive tests carried on in various parts of the country and in Alaska, and under varying operating conditions. These tests brought out the following advantages: (1) No distortion; (2) not subject to wind disturbance; (3) more impervious to water; and (4) details can be inked more clearly.

In one of the tests made in Alaska, the use of the finest grade muslin mounted sheet showed a variation of from +0.30 to —0.82% over the period of use, whereas the aluminum-mounted sheet retained its original size throughout. When it is considered that sheet distortion is one of the most bothersome aspects of planetable work, this factor was sufficient to justify the change.

The adoption of aluminum-mounted topographic sheets has been followed by notable improvements in the accuracy of positions obtained and are, in general, preferable from convenience and ease of handling by the topographers.

It is believed that eventually, a suitable transparent or semi-transparent plastic with a low degree of expansivity will become the standard medium for field work. Such a material will have still further advantages over the aluminum-mounted sheet, as it would be lighter in weight, easier to carry, waterproof, could be used for making contact photo prints, and could be rolled for mailing or storing in a tube.

Drawings for Reproduction

The preparation of original drawings of maps on plain or muslin mounted paper has been discontinued because of the recent development of more suitable materials.

For small maps, up to size 24 by 31 inches, aluminum-mounted sheets similar to those used for the plotting of original surveys, are the most popular.

For large maps up to size 36 by 60 inches, white painted zinc plates, or suitable plastics are employed. The zinc plate receives an undercoat and top coat of white paint, both of which are sprayed on, and permits the drawing of fine ink lines. There is no dimensional change in this original.

Four types of plastic materials have been successfully used in the preparation of large original maps. These materials are available in varying thicknesses, with the 0.010 inch gauge being the most popular. Unlike the zinc plates or aluminum-mounted sheets, plastic materials are available in sizes up to 51 by 150 inches. They have the added advantages of being lighter in weight than the zinc plates, are flexible, have better erasing qualities, and can be used for making direct contact prints. Dimensional changes are usually very small, are less than those for high grade mounted papers but greater than those of a mounted aluminum plate or painted zinc plate.

Lettering, symbols, and abbreviations which appear on maps and charts were formerly printed on plain paper from type or electrotype plates and pasted to the original drawing. Imprinting upon a high quality rice paper and upon both sides of thin transparent cellophane have superseded the older methods. The rice paper impressions are applied to the original drawing with a gum arabic solution; the cellophane impressions with a special wax coating on the under side. Both the rice paper and cellophane are easily removed from the original drawing and are thin enough to prevent any shadows in photography. Further experimental work is being conducted in this field.

It is believed that the use of plastic materials for original drawings will receive more attention in the postwar period.

Copper Plate Printing

In the various government agencies, many maps and charts were originally engraved upon copper plates and glass (wet plate) negatives. Impressions from these engraved plates are excellent for reproduction but the engraving usually requires more time to complete than the present hand drawn methods in ink.

Proofs from these copper plates for inspection or revision are usually made on a high quality 96 pound, 100% rag stock containing minimum quantities of bleach, rosin size, and alum, and which must not contain any chemicals that will interfere with the permanency of color or the serviceability and durability of the paper. Impressions are made after first moistening the paper with a solution of water and glycerine. The paper stretches slightly when moistened and shrinks upon drying, resulting in an unequal reduction with and across the grain from the original copper plate dimensions.

Experiments with the standard weight of high wet strength paper developed for the Army have revealed some interesting possibilities. Proofs made on this paper were found to retain more closely the copper plate dimensions. It is, however, more difficult to handle when damp and does not dry out as smoothly as the 100% rag stock. Proofs made on this paper should be satisfactory for general examination.

The final copy for reproduction is made on a high quality coated (but unsensitized) photographic paper which is backed by a single full size piece of blotting paper. Similar to the previous methods, the surface of the paper is treated with water and glycerine. The blotter backing assists in retaining the original plate dimensions, but a slight shrinkage is usually observed.

Printing Papers

Practically all maps and charts prepared by government mapping activities are reproduced in colors by offset lithography. With such a wide variety of maps to be printed, it is natural to expect that a variety of papers would be required.

The general trend in the manufacture of map printing papers during the present emergency has been toward a lower rag content and decreased weight and thickness. Large bulk shipments of charts and maps overseas required that the weight be reduced.

Originally, Army maps were printed on a fine rag paper, supposed always to be the best and most indestructible for all maps. Military forces in the South Pacific, however, had to report that the maps were bad and were rotting in 4 days. As a result Army Map Service paper experts set out to find a paper which would stand

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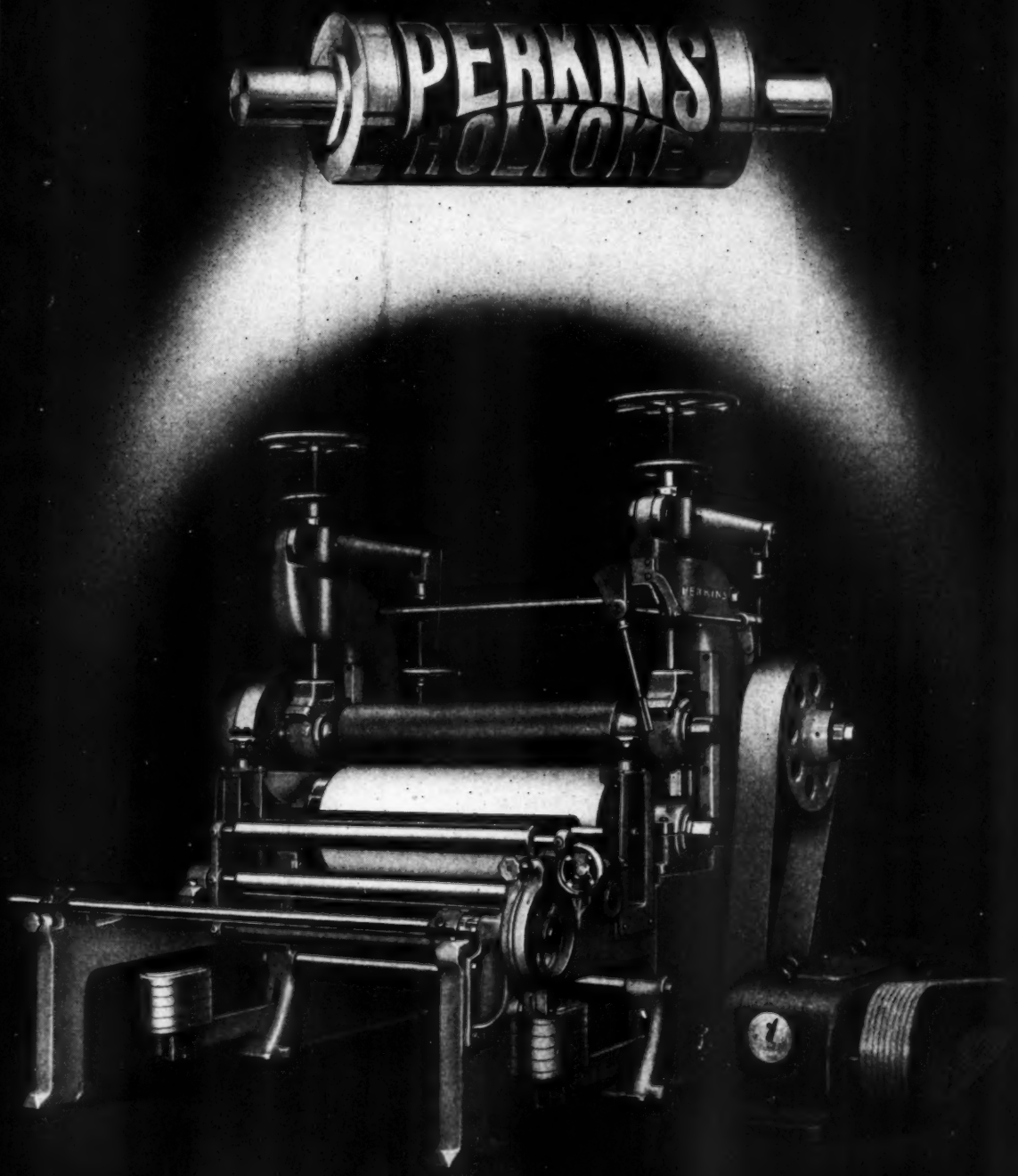

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the tropics, desert, arctic, and high altitudes. In a wood-pulp paper, 80% long-fiber spruce, they found a sheet that looked promising. The results of subsequent tests on this paper (high wet strength map) were hard to believe.

The printing, and distribution of nautical charts to the Navy and Merchant Marine offers a few problems not generally encountered with Army maps, and for this reason a different type of paper is required. Nautical charts are usually printed in small quantities, about 1,500 to 5,000 copies per edition, are stocked on shelves, and are brought up-to-date for important changes and information prior to issue by making the necessary corrections by hand. This may involve the addition of new information or the deletion of obsolete information and may require the erasing of the same area several times. A chart may be used for a long period and, therefore, should be both serviceable and durable. Certain harbor and coast charts which are frequently referred to, must have a high folding strength as most charts must be folded to be stored in the limited spaces usually found in a chart room on board a ship. The surface and finish must be suitable for offset multicolor printing, the same as for Army maps.

Up until several years ago, the paper used for the printing of nautical charts consisted of 100% rag stock, with basic weight of 96 pounds, which was later reduced to 83 pounds. With improved methods of manufacture and treatment, the rag content was reduced to 50%, the difference being made up with bleached sulphite. The weight was retained at 83 pounds. After trial for some time in air conditioned plants and because of the existing emergency, the weight was still further reduced to 80 pounds. Early in 1944, due to the continued difficulties in obtaining pulp and materials, the weight was still further reduced to 72 pounds, retaining, however, the 50% rag content.

Naturally, some lowering of physical characteristics was expected with the lowering of weight (80 to 72) and thickness but 10% more paper was produced from the same quantity of materials and resulted in a savings of 8% to the U. S. Government.

Other papers of lighter weight with varying chemical content and physical characteristics must also be used in the printing of special charts. Some charts require that the paper be translucent to permit the comparison of plotted information on one sheet with that on another, such as for weather information. Other maps require printing on more transparent paper to permit reproduction of the map and plotted information by direct contact printing, blueprint, Ozalid, etc.

Cloth Charts and Maps

A new "life raft chart" developed by the Hydrographic Office, and printed on Celanese fabric instead of paper, goes far toward meeting the suggestions of Capt. Eddie Rickenbacker—rescued after drifting three weeks on a rubber raft at sea. Unlike the paper chart he had which turned to illegible pulp after a drenching, the fabric type can be rolled into a ball under water—and then smoothed out and read as easily as before. In addition to its value as a navigational aid, it may be used as a head covering for protection from the sun, to catch rain for drinking water, and when supported by two oars may even serve as a small sail. They are yellow in color so as to be easily seen as a distress signal.

Within the space of 26 by 38 inches, it contains information vital for survival, especially the prevailing winds and ocean currents that may carry him to safety.

The Army has prepared similar pocket handkerchief maps for fliers forced down at sea.

Color Printing

The Navy having adopted red lights for night use aboard planes and surface craft, it became necessary to change the colors which had previously been shown on nautical and aeronautical charts for naval use.

It was found that red, yellow, and orange tints became invisible when viewed under a red light. Land areas previously shown in buff were changed to light gray. Orange dots marking lighted aids to navigation have been changed to magenta. Blue shading used to represent shoal water was retained, while mud flats are shown by a composite of both the blue and gray colors. Green has been retained for land tints on some aeronautical charts and brown to distinguish color gradients. While all of these colors lose their identity under red light, they do not lose their contrasting shades.

Special Maps and Diagrams

Many special maps, charts, and diagrams have been developed by the Hydrographic Office for use by both sea and air forces but some are of such a nature that they cannot be discussed at the present time.

Among those which can be mentioned are the moonlight charts showing the brightness of the moon at various times and locations and indicate when darkness will cover a raid on enemy-held territories.

"Approach and landing charts" are available which will enable flyers of average skill to make safe landings in totally unfamiliar and obscure places.

Special charts of certain areas showing, in addition to topographic details, oblique aerial views permitting easy identification proved to be of great value to Army and Navy air forces.

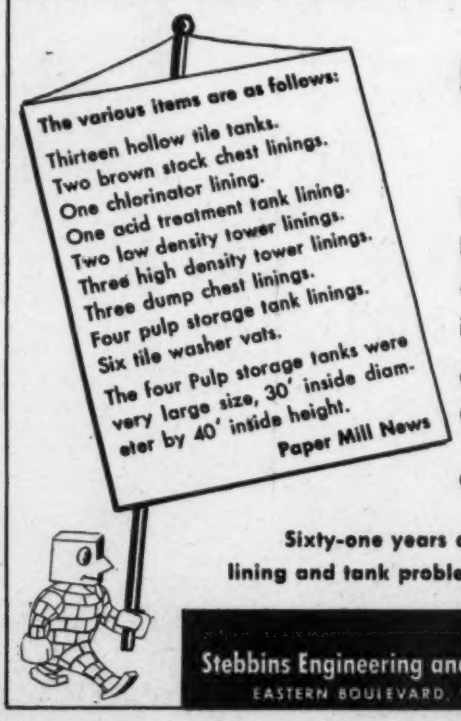
An improved star finder and identifier, developed by the Hydrographic Office, eases the task of aerial navigators especially when clouds obscure a part of the night sky.

Many technical manuals and other special publications of value to the sea and air navigator but too numerous to mention here, are published and distributed to operating forces.

Waterproofing and Fireproofing of Maps

The development of waterproofing and fireproofing materials for application to printed maps and charts has received some attention during the past two years. Both lacquers and plastic materials are now

"All tile linings and tile tanks required for the stock handling system and bleach plant were STEBBINS"


The various items are as follows:
Thirteen hollow tile tanks.
Two brown stock chest linings.
One chlorinator lining.
One acid treatment tank lining.
Two low density tower linings.
Three high density tower linings.
Three dump chest linings.
Four pulp storage tank linings.
Six tile washer vats.
The four Pulp storage tanks were very large size, 30' inside diameter by 40' inside height.
Paper Mill News

This list was printed before P.H.(Pearl Harbor) but Stebbins is still headquarters for complete lining service, providing:

ONE source of supply
ONE responsibility for satisfactory service
ONE standard of quality

Sixty-one years of specialization in solving lining and tank problems for the paper industry.

SEMCO
Stebbins Engineering and Manufacturing Company
EASTERN BOULEVARD, WATERTOWN, NEW YORK

available for this purpose. Many of the recent techniques developed are covered by secrecy orders from the U. S. Patent Office, and therefore, may not be disclosed at the present time. The properties are familiar to many users, however, in such applications as paper.

Some of the lacquers investigated include clear, plasticized solutions of cellulose nitrate, cellulose acetate, vinylite resin, and acrylate resin, all of which may be applied with either a spray or brush.

Charts and other printed materials may also be rendered waterproof by lamination between sheets of vinylite plastic. While this treatment does not permit folding a sheet through 180 degrees, it can be rolled. The surface is usually dull and reflections are practically eliminated. As with most lacquers and plastics, pencil marks are easily removed.

Production

During the period of expansion between July 1, 1941, and January 1, 1945, the Hydrographic Office grew from an organization of 300 officers and civilians to its present staff of 1,600 officers, enlisted personnel, and civilians, representing an increase of a little more than five times the number of employees.

In contrast to this growth, there was produced in the Fiscal Year ending June 30, 1941, 4,000,000 nautical, aviation and miscellaneous charts and publications, while during the fiscal year ending June 30, 1944, 42,000,000 charts and publications were produced or an increase of a little more than ten times the 1941 production.

Much of this increase is the result of new developments and the improvement of former practices in which the Hydrographic Office has played a major part.

In the preparation of the foregoing article, the author has consulted, and wishes to make suitable acknowledgment of the following publications.

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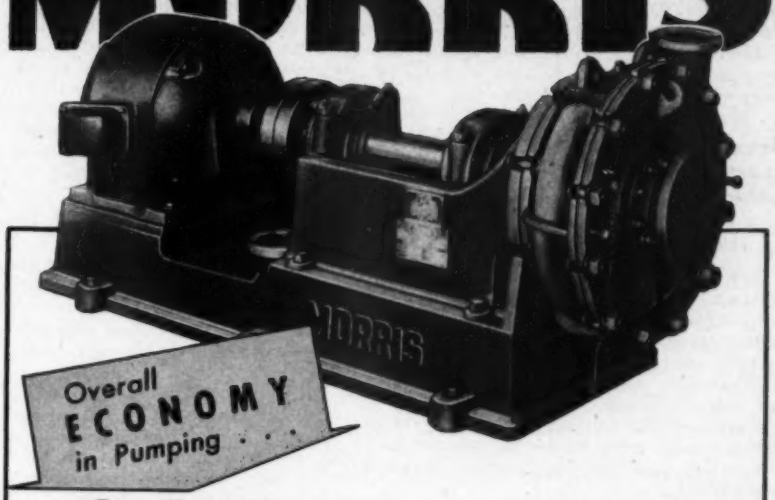
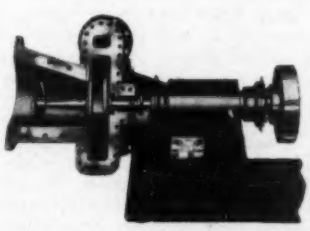
MORRIS



Black Liquors in Pulp Mills

Morris pumps are used extensively for handling black liquors and consistently out-perform and out-last lighter pumps. In performance the balanced pressure impeller reduces leakage and eddy losses, and prevents damaging quantities of gritty particles from circulating between impeller and suction disc liner, prolonging wear Wider impeller clearances reduce internal friction. Deflection is negligible in the heavy impeller shaft. Special alloy steel shaft sleeves plus larger bearings and deep stuffing boxes with extra packing minimize bearing maintenance. Morris metals endure long in service and disc liners, throat rings, and other wearing parts are interchangeable. The overall result of all these features achieves Morris Pumping Economy.

MORRIS ST-P STOCK PUMPS



In Morris "ST-P" Stock Pumps a suction booster that mechanically agitates and propels the fibre into the suction eye of the impeller, sets up the continuous and uniform flow that is so essential in this type of pump. Even with high-consistency stocks, there is little tendency to extract water from the stock or to clog the intake with dehydrated fibre. Where foaming or large amounts of entrained air are encountered, the horizontal top discharge—plus the action of the suction booster—speeds escape of the air and prevents air binding.

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Stock Pump Bulletin No. 176

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Branch Offices in Principal Cities

MORRIS CENTRIFUGAL PUMPS

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Development of "V" and "W" Board Weatherproof Corrugated Shipping Containers

W. B. LINCOLN, JR., Development Engineer Inland Container Corporation

At the time of the outbreak of the current war, special overseas types of fiberboard had not been developed, although certain special domestic containers of high-performance value were available. Many of these were strong enough for export use under peacetime conditions, but were unsatisfactory for the rough handling, outside storage, and exposure to prolonged rain or high humidity encountered in wartime shipping.

The desperate need for enough containers in which to move the tremendous volume of Lend-Lease shipments and shipments of supplies to outlying bases which the Army was establishing at that time, made it absolutely essential that suitable grades of fiberboard be developed for overseas use.

The earliest fiber boxes approved for overseas use were the so-called weatherproof solid fiber containers. These were a definite step forward compared with ordinary domestic types of boxes. This type of material was used during 1942. However, it became apparent in the late summer of that year that these containers were not of sufficient strength or weather resistance to perform satisfactorily in all of the war theatres. Technical developments which took place rapidly during the fall of 1942 enabled the industry to produce the "V" box in several grades. Tests showed these boxes to be as much as fifteen times better than previous types.

The armed-services approved the V box for overseas packing by the issuance of Quartermaster Corps tentative specification OQMG No. 93, dated 12-2-42, and similar specifications covering identical requirements, issued more or less simultaneously by the Navy and other war agencies.

These developments had again accelerated the use of fiberboard to a point where it was obvious that the limited productive capacity of the solid fiber industry would be exceeded. Fortunately, during this same period developments had been taking place in the corrugated industry which enabled this branch of the industry, with almost unlimited capacity, to match the V type solid fiber with V type corrugated in all grades. Sharing the load, the entire fiber box industry has been able to deliver V and W boxes at a rate as high as 45,000,000 boxes per month with greater production possible if needed and materials and labor were available. The corrugated industry is currently supplying approximately one-third of the total requirements.

The problem of developing a suitable corrugated fiberboard box was far more difficult to solve than the problem of producing a satisfactory solid fiber box. Because of the open cellular structure of the corrugated board, it is next to impossible to protect the adhesive from direct contact with water. Also, the nature of the manufacturing process used in combining the liners and corrugating medium offers several serious mechanical obstacles to the use of just any adhesive which might be perfectly satisfactory to stick two flat sheets together.

Overseas containers for war must incorporate:

1. High resistance to water and high humidity requiring water resistant adhesives.
2. High performance values, especially puncture and retention, to resist rough handling.
3. Compression values, if obtainable, but generally the level of compression strength of fiberboard after prolonged exposure has been too low to seriously count on any grade of box stacking well without support from the contents.

The problem of developing a weatherproof corrugated container broadly divides itself into two different approaches with many subdivisions:

1. Treatment of Domestic Board—The first method is to treat by dipping, spraying, or otherwise coating or impregnating a finished container, either in a knocked-down or setup condition, such container being made of orthodox domestic materials. This approach will not be discussed in detail since to date the degree of success has been very slight. Sufficient to say, quite a few compounds, waxes, asphalts, lacquers, paints, etc., can be applied to domestic boxes to make them fairly water resistant to a light spray if no rough handling precedes subjection to exposure to water. It is obvious, however, that the level of performance of such domestic boxes is low to start with, and surface treatment will not add materially, if at all, to that level of performance. The method in the present state of the art is at least little more than a makeshift answer which will inhibit deterioration but will not stop it. Any serious scuffing, tears, or puncturing of the container destroys the waterproof barrier and permits entry of water which will, by wick action, be spread throughout the container, resulting in its early failure, especially destruction of adhesive bonds. In general, it is believed that surface treatment of domestic types of boxes is a rather dangerous approach to the problem of providing suitable containers for overseas shipment. Inexperienced and unqualified personnel may gain the mistaken idea that such procedures are entirely effective and be led into the mistake of using them indiscriminately. Such containers are not of adequate strength to retain the continuity of walls or score lines, therefore, the surface treatment cannot be totally effective and should only be used as a last resort when really suitable grades of board are impossible to obtain. It is seldom that well managed procurement procedures can not secure proper boxes on suitable priority.

2. Building a New Board—The second approach to solving the problem of weatherproof corrugated construction is to build a box complete from special weatherproof components, incorporating the necessary water resistance and strength values to satisfactorily perform in service. This approach was the one followed in a development of the board which later became recognized as the V-3c grade, and led to the development some time later of the W-5c and W-6c grades. This approach had four basic components to deal with:

a. Adhesive—This component had to have the following characteristics:

1. Complete water resistance
2. Not subject to breakdown through mold growth or other deterioration under tropic conditions
3. Relatively low in cost
4. Adaptable to use on corrugators
5. Permit reasonable manufacturing speed
6. Mixing technique relatively simple and not too technical
7. Develop water resistance with a relatively short curing period and no special drying or heating beyond that normal to corrugator operation
8. Not involve the use of solvents of inflammable or explosive nature
9. Preferably set by heat

b. Corrugating member—This component had to have the following characteristics:

1. High wet strength, including rigidity, tear and puncture resistance
2. Compatible with water resistant adhesives used and permit a satisfactory bond to be made under corrugating conditions and speeds, in spite of its heavy sizing
3. Perform properly on the corrugator at reasonable operating speeds

c. Liners—These components had to have the following characteristics:

1. High wet strength, including rigidity, tear, and puncture resistance
2. Compatible with water resistant adhesives used and permit a satisfactory bond to be made under corrugating conditions and speeds, in spite of its heavy sizing
3. High resistance to scuffing, either dry or wet

d. Fabrication—Final but definitely not the least important component, "good fabrication," which counts for much of a fiber box's strength. Methods of fabrication had to be developed suited to the character of the other components and efficient as to productive rate and finished container values.

Many attempts have been made through the years to develop a water resistant corrugated board for use in domestic service under high humidity or moist conditions. This work has followed several lines of endeavor, many probably never publicized, but some of those that are known included methods such as:

1. Treating the combined board with an asphalt emulsion poured through the flutes
2. Using asphalt or asphalt base mixtures as a waterproof adhesive
3. Using asphalt impregnated corrugating sheets and liners

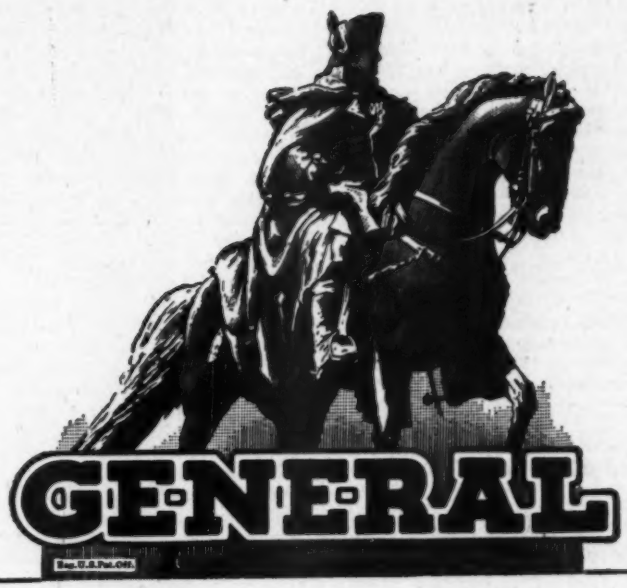
4. Using asphalt laminated corrugating sheets
5. Using asphalt laminated liners
6. Using rubber base adhesives
7. Using paraffin or other wax coatings
8. Using lacquer or other surface coatings
9. Using liners to which parchment or foil has been laminated, etc.

While imparting a degree of water resistance, none of these methods resulted in enough improvement to enable containers to meet wartime requirements. In the majority of cases, the method proved too costly to be commercially practical for wide application at the time the work was being done and many experimental programs were dropped for that reason.

It might be of interest to many who have not been close to the program to know how the weatherproof corrugated container came into being. Like so many developments, it originated as an idea which involved but a few people. The finished result, however, was only a success after a long period of intensive cooperation on the part of the adhesive manufacturers, the Southern kraft board mills, and the box-makers. Only through the consolidation of the knowledge and ideas of all of these interests was success attained.

Intensive development started early in 1941 when it was felt that there was a definite need for weatherproof corrugated board for export packing of Lend-Lease shipments to England. An intensive research program was inaugurated to develop a weatherproof corrugated container, stressing the second approach, namely the fabrication of a box from special components throughout. Experience had shown that ordinary commercial starch paste had a considerable resistance to high relative humidity. In the early experiments this adhesive was used in conjunction with special liners in several tests. Most promising results finally culminated in production of boxes made with special dense, highly sized liners, using sized 0.009 and 0.014 liners as corrugating material. The Federal Surplus Commodities Corporation was interested in this development and with their co-operation this board was tested at Forest Products Laboratory in February, 1942. Results were quite favorable and indicated real progress as compared with the zero performance of ordinary domestic grades of board subjected to submersion in water.

During the course of these experiments, a urea formaldehyde resin type glue, apparently being used by the laboratory in certain of its experiments with wood, was used to provide a waterproof seal of the flaps so that they would not open during spray and submersion tests. The marked superiority of this glue and resistance to water during the tests led to discussions with the adhesive company's technicians which soon resulted in the successful development and application of ways and means of incorporating urea formaldehyde resins in starch paste, suitable for use in the corrugating operation. Results of the tests at Forest Products Laboratory were quite favorable. Knowing that the specification for such boxes would be acceptable



RODA

High grade gas, by-product and steam coal from Wise County, Va., on the Interstate Railroad.

DENDRON

High grade gas, by-product, steam and domestic coal from Wise County, Va., on the Interstate Railroad.

STONEGA

High grade, high volatile steam and by-product coal from Wise County, Va., on the Interstate Railroad.

PREMIX STOKER

A laboratory controlled product blended to meet exacting stoker requirements. From Wise County, Va., on the Interstate Railroad.

COKE

Roda and Stonega from Wise County, Va., and Connellsville Coke from Pennsylvania.

CRITERION COAL

High grade gas, by-product, steam and domestic coal—Pittsburgh seam from Irwin Basin, Westmoreland County, Pennsylvania, on the Penna. Railroad.

CROZER

Genuine Third Vein Pocahontas from McDowell County, W. Va., on the Norfolk & Western Railroad.

Admiralty Coal

Genuine New River Smokeless, Beckley or Sewell seam from Raleigh County, W. Va., C. & O. and Virginian Railroads.

Old Kentucky

Hazard No. 4 and No. 7 steam and domestic coal from Wiscoal, Knott County, Kentucky, on the L. & N. Railroad.

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CINCINNATI DETROIT NEW YORK NORFOLK PITTSBURGH

only if the boxes were generally available from a large portion of the box industry, a meeting was arranged on April 3, 1942, at the Indianapolis plant of the Inland Container Corporation which was attended by various manufacturers of linerboard, adhesives, solid fiber and corrugated shipping containers. At this meeting the results of the Forest Products Laboratory work was discussed and additional laboratory tests were witnessed by the assembled group.

While admitting some progress had been made, the general feeling was that it was far from a success and in fact, that it was impossible to develop a weatherproof corrugated box having performance values sufficiently high to be of interest. The development work proceeded, however, and further contributions in the way of improved board components and further perfection of the urea resin starch adhesive and fabrication methods finally resulted in the production of boxes which, when tested by an independent laboratory, matched the performance of the then currently approved weatherproof solid fiber boxes in every way except bursting strength tests.

In setting up the laboratory program, the problem was analyzed by outlining the hazards to be anticipated in export shipping. These hazards were then translated into laboratory equivalents. The boxes were subjected to rough handling considerably in excess of that to be anticipated in domestic shipments in an effort to simulate hazards encountered prior to delivery to ship's side. They were then subjected to 24-hour, 7-day submersion under water, 14 days of high humidity and submersion with re-drying. After exposure to these various types of severe water hazards, these boxes were subjected to further rough handling until complete failure occurred. The results of the tests proved conclusively that corrugated could be made to match the performance of boxes meeting current specification requirements.

About this time, however, information concerning the unsatisfactory performance of fiberboard boxes in overseas shipments was brought to Washington by high ranking officers and it was decided that all performance values should be increased. As a result the armed services and WPB were hesitant to approve this newly developed and untried material. In fact, about this time orders were issued to discontinue the use of all fiber boxes for overseas shipments. It was soon found impossible to do this, however, and these restrictions were withdrawn. The need for further improvement of fiber boxes for this use was quite apparent, however, and development work was continued.

Some months later, as the increasing demand for shipping containers made it apparent that the solid fiber industry would be unable to supply all requirements, the grade of material later known as V-3c was approved and put into use for the packing of rolls of compressed toilet paper and stationery items, such as letterheads, mimeograph paper, and the like. The board which was finally approved for this use and later became known as V-3c, was essentially the same as tested earlier in the year, although the bursting strength was stepped up through the use of still heavier liners and corrugating material than had previously been developed.

Final Efforts

Adhesives—The successful development of a weatherproof corrugated fiber box was dependent upon the availability of a truly water resistant adhesive having suitable characteristics as to cost and operating performance on machines to permit the fabrication of double-faced corrugated board. Real success in the solution of this problem finally came from the development of the acid type starch fortified with water soluble urea formaldehyde resin which contributed the necessary water resistance. The use of adhesives of this type has been rather thoroughly publicized during the last couple of years, but it might be well at this time to point out certain facts in connection with their use for the production of weatherproof corrugated board.

The use of this type of adhesive on a corrugated machine is a much more complex problem than its use in the production of solid fiber. The necessity of forming the flutes at the rate of over 125 per second on rolls heated to over 300 degrees, and the need for extremely rapid setting so that the flute structure will not be lost, are typical of the kind of problems that had to be solved. The presence of so much heat held the constant threat of causing the adhesive to get in the glue pan, not only stopping the operation and spoiling the paste but presenting a very difficult cleaning job. In the beginning it was anticipated that the glue pans would have to be equipped with refrigerating coils and that rather elaborate controlling equipment would have to be provided to prevent polymerization of the adhesive before it was applied to the board. It was also feared that glue life would be extremely short under the hot operating conditions that exist in a typical corrugating plant, that batches would have to be mixed frequently and kept cold.

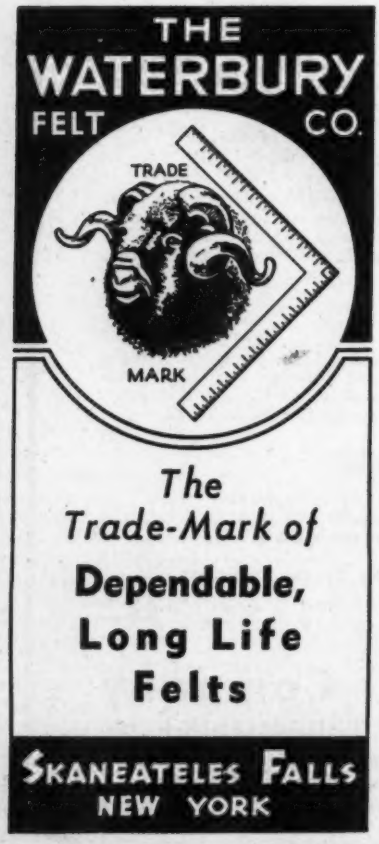
All of these problems, however, were solved and proved eventually to be capable of control with less trouble than had been anticipated. The adhesive has proved eminently successful and quite practical to run in day-in-and-day-out operation.

Corrugating Material—The early experiments in which a sized liner was used as a corrugating member indicated the desirability of working in this general direction on this component. Continued experiments resulted in a special, heavily sized, dense corrugating sheet of 100 per cent sulphate kraft fiber. To secure satisfactory performance it was necessary to use approximately 50 per cent more material than normal. In order to maintain a caliper which would permit the sheet to be fabricated on existing corrugating equipment as well as to provide a high density, water resistant sheet, it was necessary to increase the density approximately a third to secure the desired result.

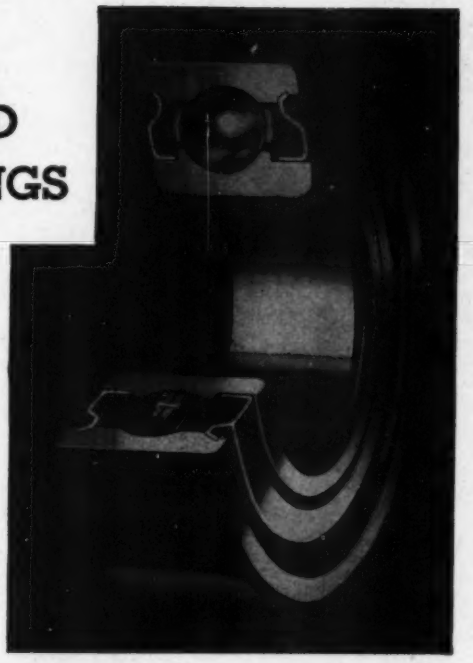
Liners—Heavily sized, dense, highly water resistant liners were used early in the course of the program. For the reasons previously mentioned, the trend of thinking during all this period of development was for better boxes of higher test, therefore, the weight and density of the liners finally adopted were considerably higher than in the case of liners used in the initial tests. It was found that these liners had to have certain definite characteristics to assure success, e.g., to properly cure or set the resin in the urea resin starch adhesives, it was necessary that a low pH be developed in the glue line and it is important that the board used be free of alkali in the fibers which might bleed out into the glue and neutralize the effect of the acid catalyst. Board must be dense and well sized so that the glue will not soak into the board leaving a starved glue line. For successful results with this type of waterproof adhesive, the resin manufacturers state that the following requisites must be met by the board:

1. It must be made from well-washed pulp.
2. It must be highly sized with rosin and alum, and must contain sufficient free alum to neutralize any eventual bleed of alkali in the fibers.
3. It must be a dense, well hydrated board, highly calendered, preferably water finished on both sides. In order to meet the conditions of service, it is also necessary that liners possess high bursting strength, high tear resistance, and high scuff resistance, both when dry and wet.

While some claims have been made that the waterproof adhesive increases the water resistance of the board, its primary



SELF-SEALED BEARINGS



"9000-DD", with Double Metal Seals, here shown; also made as "9000-D" with Single Metal Shield.

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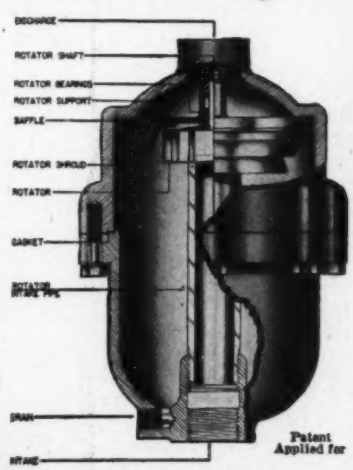

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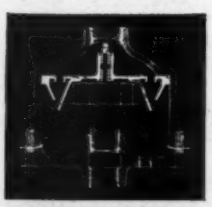

Drawing shows turbo-rotor, shroud and baffles. The design of the baffles precludes the possibility of capillary action of entrainments resulting from high velocity.

THREE MODELS AVAILABLE—A-1 will accommodate volumes from ½ to 5 cu. ft. A-2, volumes from 10 to 35 cu. ft. A-4, volumes from 35 to 100 cu. ft. Multiple units are recommended for volumes above this range. Pur-O-fier is the only standard unit that can be engineered to meet any air volume for regular or intermittent service.

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function is to provide a water resistant bond which is stronger after soaking than the component parts it joins. In general, the use of this adhesive in the attempt to make up for insufficient sizing has not been too successful. Water resistance of the board must be provided for by proper papermaking at the time the liners and corrugating member are made.

Another development in the liner field was the sisal-kraft sheet. This is an asphalt duplexed sheet reinforced with sisal fibers imbedded in the asphalt matrix joining the two paper components. This material has been awaiting the demand for its exceptional high strength values to develop.

While the use of this type of liner has been greatly restricted due to lack of sisal fiber, specifications provide for corrugated boxes made with this type of facing in both the V-1 and V-2 grade.

Progress and Application—As mentioned before, the first application of the weatherproof corrugated box by the armed services was made in the fall of 1942 at which time a number of paper and stationery supply items required by the Quartermaster Corps in very large volume were specified packed in either corrugated or solid fiber of 400 pound dry test, 150 pound wet test, after 24 hours' submersion, and with ¼-inch ply separation permitted after 24 hours' submersion.

A few weeks later, or about the middle of November, the testing program being supervised by the writer for the Quartermaster Corps was completed and, based on the results obtained, specification OQMG No. 93 was prepared and issued as of December 2, 1942. This specification provided for a V-1^{r}c reinforced double wall corrugated grade of board, having a 750 pound dry test and 500 pound wet test after 24 hours' immersion. Also a V-2^{s}c single-wall, corrugated container with reinforced outer liner, having a 400 pound dry test and 250 pound wet test after 24 hours' immersion, and, finally, the V-3c testing 400 pound dry and 150 pound wet after 24 hours' immersion.

From this time on many suitable applications for corrugated V boxes were found and the volume of production as well as the number of available sources of supply multiplied at a rapid rate. One of the early developments was the application of the V-3c to the packing of beer in glass bottles for overseas shipment. This application necessitated the development of a lighter weight board for use as inner packing. Realizing it would be very difficult to induce all manufacturers to secure and have available a special grade of liner just for this purpose during this rather trying development period, it was decided that a sheet of combined board might be developed using the 0.010 inch corrugating material for the two facings, as well as the corrugating member. An experimental run of board of this combination was immediately made and proved to have the necessary characteristics to handle the job. This type of board was written into the beer specifications and served for nearly a year with no further identification.

As time went on it became apparent that many inner packing boxes currently being made of domestic board were either proving not satisfactory or involved the expensive operation of wrapping with waterproof paper. Also some of the heavy grades such as the V-3c or V-2 were at times being used for extremely light weights thereby wasting critical material. It was obviously desirable to have generally available, and covered by specifications, one or two grades of material lighter than the V-3. It was decided that the sheet made with three 0.010 corrugating sheets, previously mentioned, would prove satisfactory for the lowest test combination, and this was adopted and given the designation W-6c.

It was further decided that one intermediate grade would suffice and tentative standards of 275 pound dry and 100 pound wet were established as desirable characteristics. An experimental run showed that this objective could be met with a 0.016 weatherproof type of liner combined with the standard 0.010 weatherproof corrugations. This sheet proved quite acceptable and was designated W-5c. The numbers of these two additional grades, fitting into the original pattern of grade numbers assigned to the V boxes. (Grade 4 was originally assigned to a high test domestic type of board. To avoid confusion, this number was skipped in the V and W series.)

It might be mentioned at this point that in all their characteristics, the W boxes are identical to V boxes. They are simply lower test grades of the same family. The Quartermaster depots had been instructed to consider the V compliance symbols as indicating an acceptable overseas shipping container. W boxes were in general of too light construction to be used as exterior containers. It was, therefore, felt desirable to use the code letter "W" on these lighter grades so they would not be used as exterior containers except when specifically authorized.

The first application of the W-5c board was a special authorization of this kind which permitted its use as an exterior packing box for either bottled or canned beer. The V-3 pack, using sawdust as cushioning material, had been so satisfactory for beer and the record of breakage so extremely low that this seemed a desirable move, especially in view of the fact that a very large tonnage of critical kraft pulp was saved by the change.

These two new grades of board were first described in Quartermaster Corps packing specifications for bottled and canned beer and were later incorporated in joint Army-Navy specification JAN-P-108. They are currently being widely used for packing of many small parts, especially items which are assembled in larger packing cases for shipment abroad, but which will be delivered to the actual fighting front in the W box as an outer container for the final short handling from the base depot to the front.

Waste Water Utilization by Clarification

CHARLES CARPENTER[1] and COVER G. PORTER[2]

The initial units of Southland Paper Mills, Inc. consisted of the groundwood mill, one 234-inch fourdrinier, power plant, and necessary auxiliaries for the production of approximately 165 tons of newsprint per day. Water was supplied from five deep wells approximately 1,000 feet deep in the Carrizo stratum. As a matter of economical operation, emphasis was placed on all possible rescue of white water within the groundwood mill and newsprint mill.

In the latter part of 1941, plans were laid for the addition of a 175 ton kraft mill. In order to economize on water, it was felt that further utilization of waste effluents that go out of the mill should be investigated from a viewpoint of using these waters in a manner not ordinarily done in the pulp and paper industry. In the early months of 1942, a suggestion was made by the Permutit Company that the Spaulding type precipitator might be employed to separate the suspended solids in these waste effluents from the water so that either one or both could be reused back in the system. As the suspended solids content of the waste effluents consisted entirely of wood fiber, the presentation of this idea was radically different from the utilization of the Spaulding type precipitator for other uses.

(1) General Superintendent, (2) Chief Chemist, Southland Paper Mills, Inc.

In conducting laboratory experiments to determine if the Spaulding type precipitator principle could separate the suspended fiber from the accompanying water in continuous operation, cylinder tests were first made to study the settling rate of these solids. White water, or waste effluent from the main sewer, was placed in 1000 ml. graduated cylinders and it was observed that the suspended fibers would settle very readily if the total solution was not contaminated with air bubbles. If the solution was contaminated with air, it was found that minute bubbles clung to the individual fibers and caused them to float and congregate at the top of the cylinder instead of at the bottom. It was, there, seen that the first step to take in setting up a continuous operation experiment was to remove the air from the water. An apparatus was, therefore, devised as shown in Figure 1. Water to be tested was passed into the small head-

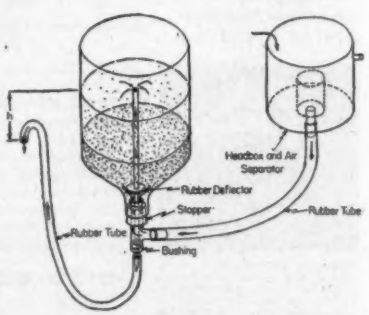

Fig. 1—Laboratory apparatus

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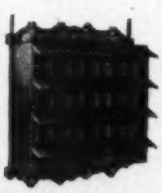

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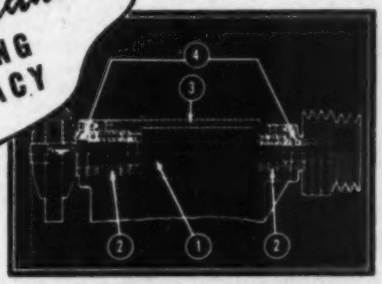

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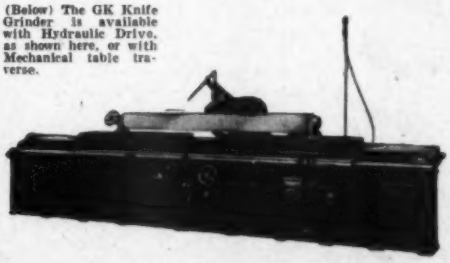

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box which was so arranged that the effluent from the box was drawn off beneath the surface of the water which allowed the air bubbles to rise and escape from the surface. The mixture of water and suspended pulp fibers passed into the bottle until it was full and then overflowed down the ¼ inch pipe to which a rubber hose was fitted for the purpose of varying the rate of flow by raising or lowering the point of discharge. The initial flow was started off at a very low rate in order to build up a sludge blanket of settled fiber and then increased to a value which would give a flow rate of approximately 1 gallon per minute per square foot of bottle area. Figure 3 shows the component parts which consist of a ¼ inch pipe threaded for about 3 inches on the bottom end, a ¼ inch to ½ inch bushings, a ½ inch tee, a ½ inch closed nipple, and a ½ inch by 3 inch nipple. A rubber stopper to fit the 5 gallon bottle and bored to fit the ½ inch by 3 inch nipple plus a rubber deflector made out of gasket material complete the pieces. The influent passed into the ½ inch nipple from the combination air separator and headbox and the effluent overflowed into the top of the ¼ inch pipe inside the bottle and passed out through a rubber tube which was slipped over the small piece of ¼ inch piping seen protruding from the bushing which is screwed into the tee.

As there were no means to draw off the concentrated sludge after it had been left behind in the bottle, the maximum duration of the individual runs was only about 3 hours after which the sludge became so heavy that it boiled up into the clarified water zone and necessitated starting all over again with an empty bottle.

It was felt that the results obtained from the inverted bottle clarification experiments justified further investigation of the Spaulding precipitator theory of continuous removal of suspended pulp from water. It was decided, therefore, to carry on this investigation with a pilot plant.

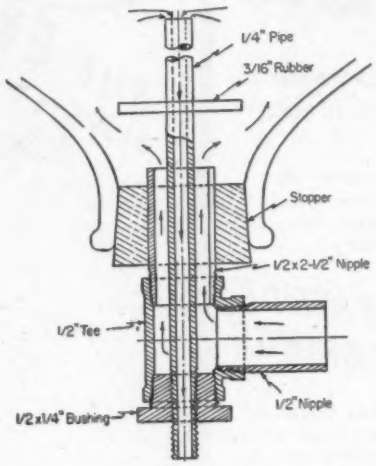
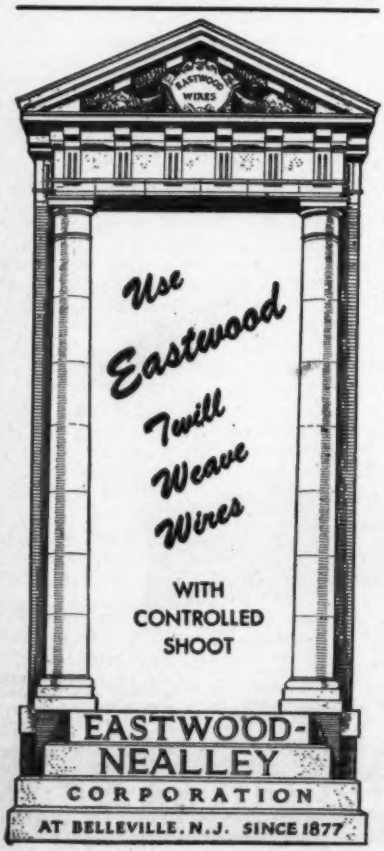


Fig. 3—Detail of inlet assembly

The pilot plant was was started in the spring of 1942 and completed in the early summer of the same year. A small precipitator, 3 feet in diameter and 5 feet high, was obtained from the Permutit Company and certain home-made auxiliaries were made at the mill. As shown in Figure 4, a 50 gallon drum was used as a headbox and also acted as an air separator by placing a 5 gallon can in the bottom and above the takeoff so that air bubbles were allowed to rise to the surface. Internal construction of the precipitator is also shown in a simplified form. Waste effluents supplied from the headbox passed into the conical section, passed under the edges at the bottom of the tank, and rose to a collecting launder from whence it flowed out of the unit by gravity. An external sludge concentrator was made from a 50 gallon drum consisting essentially of an open pan in the bottom of the drum where the sludge could settle and be periodically withdrawn to waste through the uptake cone. A collecting launder in the external concentrator allowed the passage of clear water out of the concentrator. Consequently, in those tests where the concentrator was used, this effluent was a part of the output of the unit as a whole.

The purpose of the pilot plant operation was to determine the effect of the variables encountered in the sewer, such as concentration of suspended solids, temperatude, pH, etc, and to establish the clarification mannerisms of this type of equipment in terms of gallons per minute per square foot of area, the effect of velocity, and to get some idea of the maximum sludge concentration which could be handled. With this in mind, the pilot plant operation was split into two phases. The first phase consisted of operation of the precipitator alone without external sludge concentration, and the second phase with external sludge concentration.

It was found in general that the variations of pH as such in the mill effluent did not materially affect the clarification operation, that changes in concentration of the suspended solids affected or did not affect the operation depending on the duration of time for which the solids content stayed at its new value, and that a sudden increase of solids content in the mill affulent for just a few minutes was absorbed by the buffering action of the volume of water in the precipitator while increases of a longer duration would make the precipitator effluent somewhat murky. Changes in temperature of the mill effluent was the variable that affected the operation most. A sudden increase in temperature of such a duration that gave an appreciable temperature difference between the influent to the precipitator and the effluent from the precipitator caused the sludge blanket to break loose and thus contaminate the effluent. This was apparently caused by the decrease in density of the sludge blanket in the bottom of the tank when the temperature rose which allowed this stratum of a lower density to rise into the cooler upper portions. It was also found that a sudden increase in velocity caused by an increase in the rate of flow into the unit would



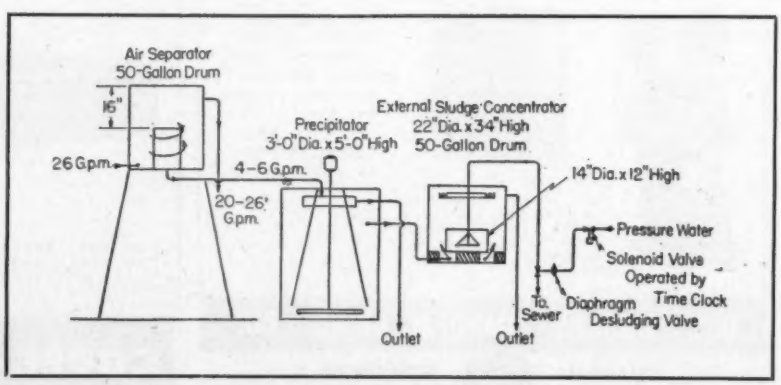


Fig. 4—Diagram of pilot plant

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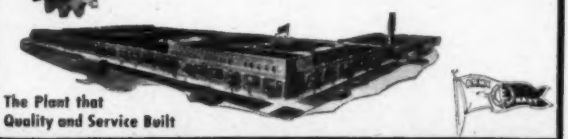

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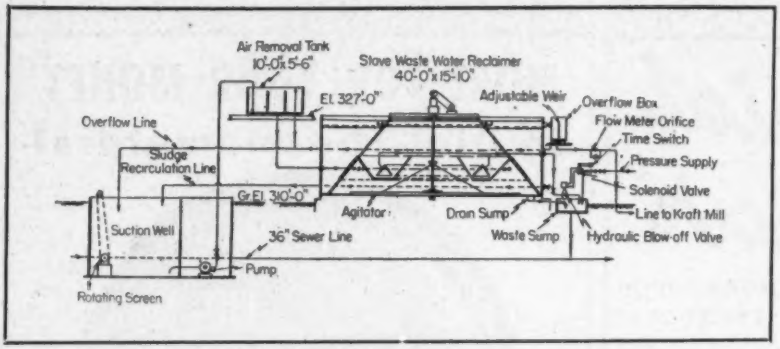

Fig. 5—Flow diagram of commercial unit

cause the sludge blanket to lift and expand and contaminate the effluent.

Based on the experience gained in the laboratory experiments and the operation of pilot plant in the field, it was decided to construct a full size industrial unit. The plant was designed to deliver 1180 g.p.m. and remove at least 85 per cent of the suspended solids contained in the influent. The port rate was to be 4.95 gallons per square foot of collecting area, and the surface rate was to be 1.03 gallons per square foot of exposed water surface. The retention time was to be 120 minutes, and the sludge concentrator volume to be 1,590 cubic feet. The same problems were to be overcome in the operation of the large unit that had been encountered with the smaller units.

First, some means had to be provided for collecting the water from the 36-inch main sewer line and elevating it to the operation point. Second, the air had to be removed from the feed before it entered the clarifier. Third, means had to be provided to run the unit as a whole at a more or less constant rate of flow in order to avoid sudden changes of velocity within the clarifier. Figure 5 shows the flow diagram of the unit, and the manner in which the three primary problems were solved.

A concrete well was built around the 36-inch sewer with a dividing wall present to house the 3,000 g.p.m. pump and motor. After the well was completed, a 10-foot section of the 36-inch sewer was simply removed and replaced with a perforated screen which was revolved by a chain and spur gear drive. The water is picked up from the suction well and pumped to the air removal tank where a constant overflow is maintained back to the suction well. The feed to the clarifier is taken off below the surface and regulation of the flow is carried out by a valve between the headbox and the clarifier.

Distribution of the influent is through the circular ring underneath the main bottom baffles at six equidistant points around the circumference of the distributor. The clarified water flows into the collectors and from there into the weir box. Adjustment of this weir to allow a slight overflow of clear water back to the suction well gives any decided quantity of clarified water to the kraft pulp mill where it is used just as if it were fresh water. The sludge withdrawal shown in the cross section takes out of the concentrator section at eight equidistant points around the circumference of the concentrator.

When the unit was first started up in December of 1943, it was found that the effluent contained as high as 1 pound per thousand gallons of suspended solids which proved to be groundwood rejects from the secondary screens in the groundwood mill. It was soon found that these coarse rejects did not have the property of self-flocculation on large scale operation and they were accordingly diverted to a sewer that bypassed the clarifier entirely. The amount of water bypassed was small and no consequences to the operation as a whole. During the initial periods of starting up the clarifier, various speeds of agitation were employed, and it was found that the speed of agitation had no bearing on the operation of the clarifier. Intermittent desludging versus continuous desludging was studied but it was found that the intermittent desludging was preferable as the relatively large volume of water blown out in a relatively short period of time gave high velocities within the concentrator section which acted to scour the bottom and thus keep the concentrator free and the pulp in a fluid condition.

After about 2 months operation, it was noticed that profuse slime growths were coating the collecting troughs and stopping up the holes with a consequent reduction in flow. A chlorinator was installed and chlorine injected at two points. Approximately 150 pounds of chlorine per day was injected into the riser leading to the air removal tank and approximately 50 pounds per day was injected into the clarified water at the adjustable weir box in order to protect the kraft pulp mill from slime infection. The chlorine application was found to be completely satisfactory, and, in this particular case, was superior to any other type of slime prevention.

After the technical service department had operated this clarifier for some six months, and the initial difficulties disposed with, the operation was turned over to the pulp and paper mill operating crews. The unit was included as part of the mill water system, and as it had been found that an operator was not required in continuous supervision, the auxiliary fireman from the power house makes a tour of inspection every four hours to see that the motors and pumps are running, checks the bearings, and see that the desludging system is working. As the feed to the clarifier comes from the groundwood and newsprint mills, and as the effluent from the clarifier is utilized by the kraft pulp mill, the two mills work in co-operation to operate the clarifier in the event that something goes wrong and the unit must be shut down, started up, etc. On a few occasions, the effluent from the clarifier has become contaminated with pulp from the sludge blanket and this was immediately noticed by the operators in the kraft mill washroom. On these occasions, the pulp mill tour bosses merely switched from clarified water to the fresh water system and allowed the clarifier to settle down before it was cut back into the kraft mill.

Normal shutdowns of either of the paper machines do not affect the quality of the clarified water. Although a large stock load is suddenly thrown on the system by the dumping of headbox, wire pit, or vats, it is of short enough duration to be absorbed by the sludge bed. Try cocks inserted in the side of the tank show that the sludge bed in normal operation extends about two-thirds of the way up the tank, although it may rise and fall a few feet either way from time to time.

The following operation costs have been arrived at over a period of six months' operation. Two hundred pounds of chlorine per day at $3.50 and $1.00 a day for repair labor and material, bring the expendable materials to a total of $4.50 a day. Power requirements are estimated at $2.36 per day which brings the overall total to $6.86 per day. Based on 1000 gallons per minute, the resulting cost is $0.51 per thousand gallons.

Printing with Plastics— Latest Tests Indicate Potentialities of Plastic Plates for Newspaper Printing

R. C. BULLEN
Bakelite Corporation

Plastic plates are not new; experiments with cellulose nitrate were made years ago. Bakelite Corporation has, over the years, conducted a great deal of research and development on them. One result is Bakelite phenolic matrix material, used in the production of the duplicate plate. Vinylite plastic moulding compound is employed as the duplicate plastic printing plate material because of its toughness, dimensional stability, and moisture-resistance. One of the outstanding postwar probabilities for the plastic printing plate is newspaper use.

Preliminiary tests have been run which show the plastic printing plates to be infinitely superior to the standard stereotypes for newspaper printing. However, there is even more development work to be done. As new plastic plate materials are being developed—and this work is now going on—there is need for some

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Groundwood Bull Screen Rejects
Groundwood Knotter Screen Rejects
Groundwood Fine Screen Rejects

Kraft Knotter Rejects
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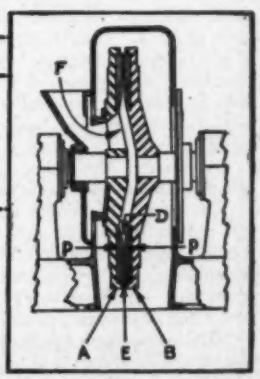
Licorice Root Fiber
Bamboo Fiber



Stock enters at F; passes between plates PP, positioned between disks A and B . . . and is discharged at E.

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Preventable accidents often cause more than physical or mechanical damage . . . they undermine employee morale. Avoidable accidents can start whispering campaigns that delay production and create ill-will for your company.

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PAPER and PULP SECTION

To make Council Membership of maximum service, safety administrators of member companies are enrolled in the Industrial Section where their chief interests lie. Safety directors whose companies are engaged in similar operations thus pool their knowledge and experience.

Sectional news letters afford a medium for presenting and exchanging information on specific industrial safety problems and ideas on specific hazards. Section members also cooperate in preparing Safe Practices Pamphlets, Data Sheets, Instruction Cards, etc. The Paper and Pulp Section is extremely active in all Council activities.

For Free Information Write:

UNIVERSAL SAFETY

NATIONAL SAFETY COUNCIL

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changes in design of printing machinery.

On the other hand, the following must be taken into consideration: the molding cycle for both matrix and duplicate plate is comparatively longer—15 minutes as compared with much shorter cycle common in sterotype reproduction. The solution of this problem will be: first, a new molding compound; second, injection molding, as the latest type of injection molding machines for this type operation is capable of handling with ease a full size newspaper page plate, with a considerable reduction in the molding cycle.

One of the outstanding records of the plastic plate is the printing of *Time* Magazine's overseas edition. This magazine, printed in far-flung outposts of actual battle theaters under far-from-desirable conditions, has proven indubitably that even with inferior inks and paper stock, the result is outstandingly true and clear.

The light weight factor, which permits higher press speeds and greater ease of handling, is another advantage of the plastic printing plate. It weighs one-eighth as much as a metal plate of equal dimensions. Obviously, the plastic plate is keyed to air transport not only for the world but within this country. Lightness in weight is also a definite asset in plates for rotary presses. Vibration—caused by the centrifugal action of the metal plate on rotary presses as high speeds is greatly reduced. The hardness and durability of the printing surface permits runs comparable with those from average copper electrotypes. Runs of 250,000 to 370,000 are being achieved. Although this is actual practice today, the company's staff is not satisfied, and in the postwar period even longer runs will be commonplace utilizing new materials that are now in the experimental stage.

The process for production of the new plastic printing plates is simple. The equipment required consists of a rigid, accurately built, hydraulic press which has either steam or electrically heated platens and is capable of exerting and maintaining a pressure of 1,200 p.s.i. on the working area. In addition to this, a lightly built, inexpensive "chilling press" consisting of two parallel platens, water-cooled, and actuated by a screw mechanism is needed. Trimming and beveling equipment for preparation of plates is also required.

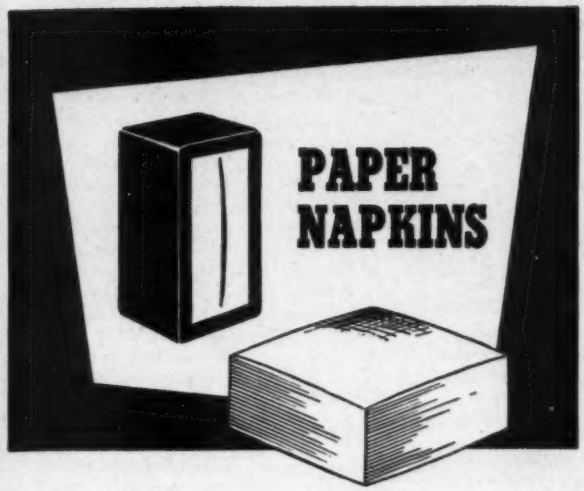
There are two steps to making the duplicate printing plate. First, the production of the matrix from the original photoengraving, zinc etching, type form, other metal pattern which is to be reproduced. Second, the molding of the duplicate plate from the matrix.

After careful inspection of the engraving, a thin coating of fine colloidal graphite in water solution is applied. This is brushed until thoroughly dry and acts as a precautionary measure to fill any deep undercut which might retard release of the matrix after molding.

The matrix material is a phenolic matrix sheet. It has been successfully used in the resilient printing plate industry for years and has been approved for service by many leading plate makers, printers, and paper converters. The material is supplied in sheet form in a variety of sizes and types appropriate for various service applications. This matrix material is thermosetting. That is, it softens on the application of heat and then hardens, or polymerizes, into a rigid mass which maintains its shape thereafter even under high pressures.

In the actual production of the matrix from the original, the original metal pattern is placed in the press covered with a sheet of the approximate matrix material. The molding press is operated at 300 Fahr. Through a simple manipulation, the pressure is established between the matrix sheet and the metal pattern. After a short period, the resin of the matrix sheet has softened sufficiently to permit the metal pattern to be pressed into it. This is accomplished by increasing the pressure. The press is held in fixed position for 10 minutes, during which time the resin polymerizes or "sets" fixing the negative impression of the original pattern in a smooth, hard, matrix surface. Now the matrix has become permanently hard and is ready for use. It can be stored indefinitely without deterioration.

The plastic plate material is supplied in the form of granular powder or in sheet form, depending upon service requirements. Production of printing plates from this material is even more simple than making the matrix. It softens readily when heated and becomes hard and tough when



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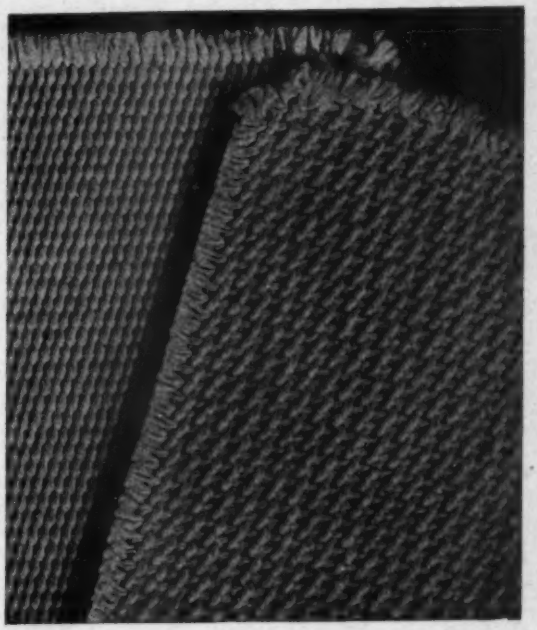

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TRI-UMPH all cotton, 3 ply 53 oz. widths up to 250".

ZEPHYR all cotton, 3 ply 45 oz., widths up to 196".

ZEPHYR cotton-asbestos 3 ply Face 50% asbestos, back open construction for high porosity. Widths up to 166".

HINDLE S/54 all cotton special weave. Extra heavy duty Preshrunk, high porosity, widths up to 170".

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Frank P. Wilder, Portland, Ore.

cooled. Unlike the matrix material, it is thermoplastic and can be heated to proper temperature which ranges from 260 to 300 Fahr., depending upon the type of plate material used. The matrix face is first coated with a special lubricant, and the charge of plate material is distributed over the surface of the matrix. The assembly of the matrix and molding powder is placed in the press and covered with an insulating panel which distributes heat uniformly across the material.

The press is then closed to firm contact and held in position for 3 minutes during which the material thoroughly softens. Then higher pressure (about 1,200 psi) is applied. The thickness of the finished plate is predetermined by the use of steel thickness bearers, or stops, which are placed between the platens of the press, outside the working area.

When the plate is formed, the press is opened immediately and the entire assembly, including the insulating panel, is transferred to a chilling press where a light pressure is applied for 1.5 minutes, drawing the heat from the assembly. The plate is now hardened and may be removed from the matrix. It can then be trimmed and either beveled for patent base or nailed to a wooden block. In cleaning plates, alcohol, gasoline, naphtha, kerosene, or carbon tetrachloride may be used without injury to the plates. In storing, they should be kept where temperatures will not exceed 140 Fahr.

Today, the plastic printing plate is doing an excellent job, in fact, many jobs—some for the Office of War Information; some for the Government Printing Office; some for the propaganda units both ours and those of our allies; others in the replacement of critical metals. The industrial advancement in the true American tradition.

REDUCE REGISTER COMPLAINTS

If printers and lithographers will use the *Cambridge* Printers' Moisture Indicator to determine the relative humidity of paper and pressroom, they are in position to avoid the most common cause of "off register." This accurate, rugged instrument has the measuring element enclosed in a blade for insertion between hung or stacked sheets. An adjustable index pointer is provided for fixing reference points.

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CAMBRIDGE PRECISION INSTRUMENTS

Bituminous Emulsion Developments for Weatherproof Boards

E. M. LORENZINI, Supervisor, Bitusize Sales, American Bitumuls Company

It is estimated that considerably more than half of the present solid fiber V-box production employs bituminous emulsions either in the form of internal sizing or as an extender for weather proof laminating adhesives.

When used as sizing, the bituminous emulsion is admixed directly to fiber stock and flocculated with alum prior to paper formation as in other general sizing procedures. One of the basic features of this size is the fact that higher than normal percentages of bituminous solids can be employed with the fiber with good retention and thereby attain unusual degree of waterproofness in the finished paper.

The bulk of this type of bituminous sizing has been applied to multicylinder boards. In the earliest practice, it was deemed necessary to confine the sizing to the filler moulds using untreated liner webs on the first and last cylinders. At the present time, V-board components of various types are also made with throughout bituminous sizing or with single untreated liners, all without harm to the wires or felts of the paper machine.

It has been well established that in finished combined V-boards, bituminous sizing accounts for a very high wet bursting strength, despite a relatively high 24-hour water-immersed absorption test. Thus preservation of wet strength is predicated mainly from the preclusion of water from the individual fiber rather than from the interstices of the board.

The phenomenon of this type of wet strength retention is particularly apparent in the relative low densities of fourdrinier kraft liners. Bituminous emulsion sizing of fourdrinier boards is a recent innovation which has proven entirely successful in mill-scale operations. In such instances, for use as V-board liners or components, 0.015 inch fourdrinier kraft sheets are being produced with dry bursting strengths of 115 pounds, and unprecedented immersed 10-minute and 25-minute wet bursting strengths of 85 and 50 pounds, respectively. This makes possible efficient and economical V-2-S combinations having dry bursting strengths of a range from 700 down to 600 pounds which will also meet the 24-hour wet bursting strength requirements. In these cases, bituminous sizing can be counted upon for an 85% retention of dry strength without need for the cost and fiber waste involved in the use of hot asphalt duplex barriers. In other words, high wet strength is made possible without continuous asphalt membrane barriers, and cost savings are accomplished with lower dry strength components. In addition, broke and waste, or trim from bituminous sized paper machine or combiner operations can be repulped in the beater without hazard, thereby resulting in the further saving of uncontaminated good fibers for reuse.

In the earliest practice it was deemed necessary in V-boards to employ up to 10% bituminous solids figured on the dry weight of the fiber being treated. In such cases, in multiple cylinder operations, even with untreated top and bottom webs, this left a bitumen content in the finished sheet, ranging between 7 and 8%. It is now common practice in certain type components to reduce the bitumen solids admixture to 6% of the dry fiber which with single or double untreated liners may result in less than 5% bitumen content in the finished sheet. In this regard, bituminous emulsions offer a prospective field even in the degrees of slack sizing.

When viewed as an internal sizing, bituminous emulsions definitely retard water vapor transmission.

Bituminous emulsion sized weatherproof chipboards are used largely as filler components for lower category V-S and W-S boards where good wet strength insurance is obtained with admittedly lower quality stocks. It is not unusual for this type of board combination to render from 60 to 70% retention of dry strength. Better quality chipboards of this same type are also used as fillers in V-S-S combinations where, with asphalt duplex liners, the high resulting wet to dry strength ratio makes it possible to use less kraft. In such cases, the wet-dry strength ratio may be 90% or more.

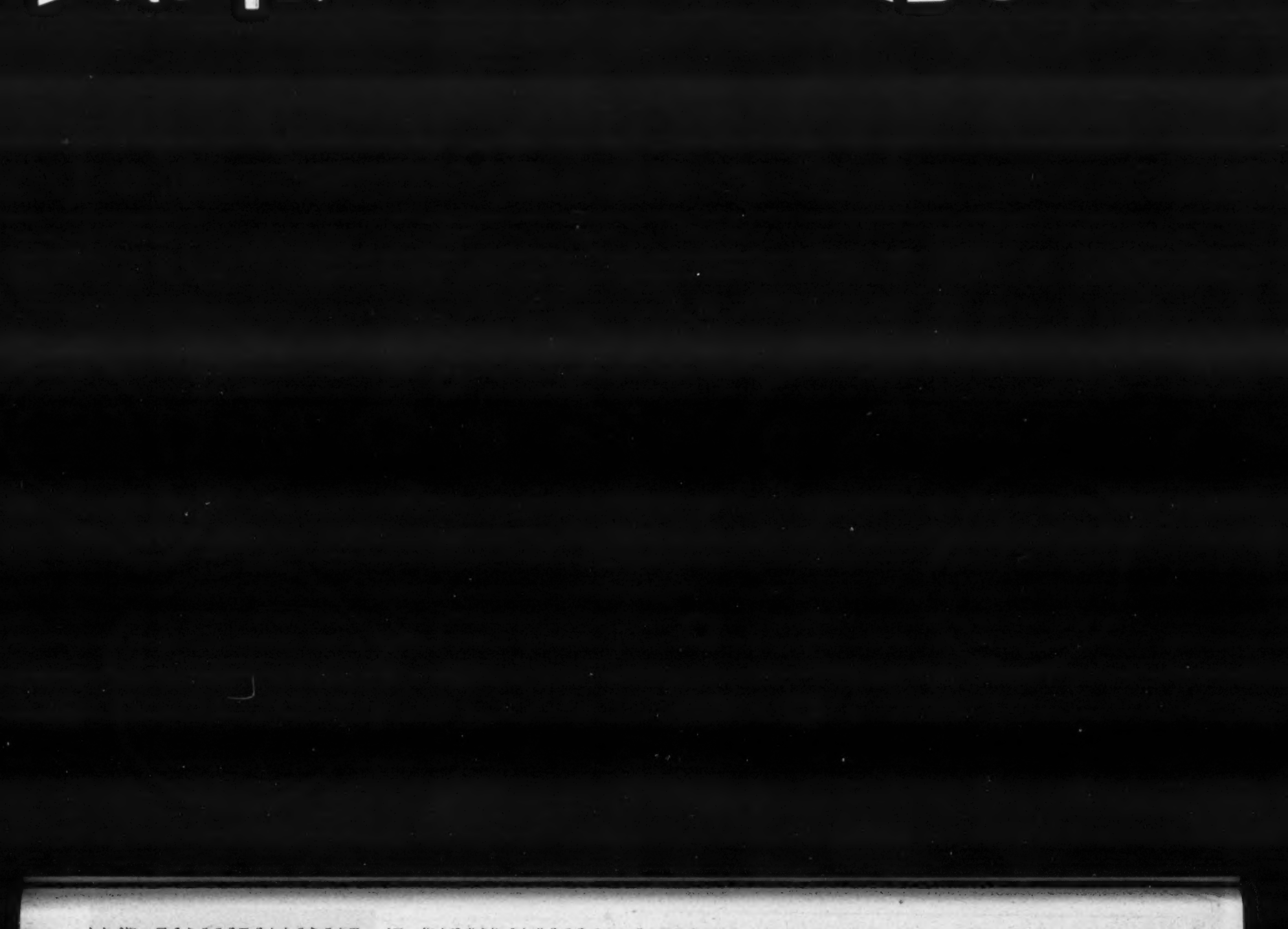
Weatherproof jute liners readily serve as V-3-S surfaces but find a more significant use as V-2-S liners where good waterproofing protection may be afforded to interior kraft fillers. This latter use makes an economical V-2-S combination, where wet to dry strength retention ratios may run from 70 to 80% and eliminates need for hot asphalt duplex.

In the category of variable bituminous emulsion sized all kraft liner combination, it is readily possible to attain highly efficient V-2-S performance where wet to dry strength ratios may reach from 80 to 100%. This is the method that has been adopted by several large producers, which, with elimination of duplexes, has resulted in considerable savings of good kraft fibers.

Before leaving the subject of internal bituminous sizing, it may be of interest to postwar planners to know that this type of bituminous size offers a practical compatibility with many of the costly synthetic resins which it is believed will be released in volume after the war. Extension of these resins for integral use in paper will undoubtedly lead to a host of postwar specialty products. Similar extensions of resins for laminating adhesives are already well established in the V-board program.

The type of bituminous emulsion now in general use for admixture to costly so-called weatherproof glues is entirely different from that used in sizing. The basic bitumen is of a tacky nature, and the emulsion is a fine dispersion made

(Concluded on page 788)



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Wherever paper-making processes call for the use of spray nozzles, *engineered* Spraying Systems nozzles can do two things. (1) They provide dependable accuracy in both spray angle and quantity of liquid sprayed. (2) Each of the types in which these nozzles are available will reduce waste, do better spraying because they're precision-built to use every bit of available pressure. See Catalog No. 22 for the key to lower costs, greater spraying efficiency. Write for your free copy today.

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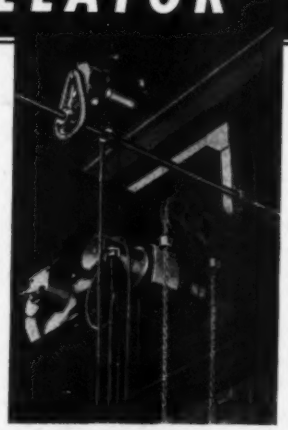
MOTOR TRAVEL for Hand Traveled Crane Bridges
THE *Northern* "TRAVELATOR"

Less than half a day required for application—no dismantling of crane—any good mechanic can apply the Northern "Travelator."

It provides pendant push button controlled electric power travel for hand traveled bridges within the range of 10 tons capacity.

The "Travelator" is an inexpensive, thoroughly effective durable device.



WRITE FOR BULLETIN 11

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FOR HIGHEST *Efficiency* IN THE COLORING OF PAPER STOCKS
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Qualities **which make these fine colors helpful to the paper maker are:**

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Five standard shades—light to dark—yielding clean clear creams, ivories and buffs

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Rich deep reds which extended with white produce desirable shades of orchid, coral, pink

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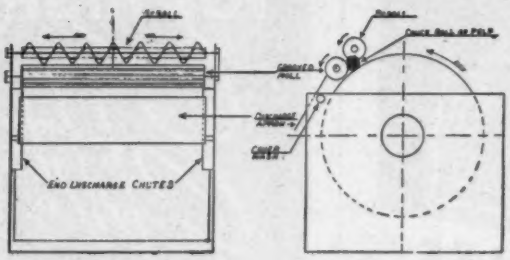
NEW EQUIPMENT AND SUPPLIES

Discharger for Deckers and Saveralls



Oliver United Filters, Inc., 33 West 42nd St., New York 18, N. Y., has announced the Oliver Denhard (O-D) Discharger for application to groundwood deckers and saveralls. The discharger consists of a rubber covered pick-up roll which revolves with positive clearance to roll up the decker or saveall sheet. This rolled up sheet is removed continuously by screw conveyor to chutes at each end of machine vat. Among the features of the discharger, cited by the manufacturer, are the following: the consistency of the discharged sheet is exceptionally high for decker operations; positive clearance protects the wire (nothing touches the wire except the sheet itself); and power take-off is from main drive motor with a demand of not over one-half horsepower.

Sectionally-Supported, Insulated Smoke Stack

Chicago Fire Brick Company, 1457 Elston Ave., Chicago 22, Ill., has announced the development of a sectionally-supported, insulated smoke stack.

Utilizing an inner wall of fire brick and an outer casing of tile, sheet steel, Transite, or other waterproof material, the stack is built up around a hexagonally-shaped steel structure. Horizontal and vertical members are attached to the steel structure, and these members, in turn, support anchor and tile retaining castings. Each fire brick forming the inner wall is individually retained. When the outer casing is of tile, the tile are supported by means of channels at definite spacings. The brick and tile in any section of the stack can be removed without affecting any other section.

Air vents are located both at the bottom and at the top of the stack. Likewise, insulation is provided between the tile and retainer castings; and there is air space between the insulation and the outer tile throughout the stack.

The stack can be erected in any height from 50 to 300 feet.

According to the manufacturer, the stack designated as *Durabilt*, is built like a skyscraper, will resist high wind load, shock, lightning and earthquakes; provides improved draft; and requires less foundation because of weight savings.

Jet-Type Agitator

A new type jet, which utilizes steam, air, or solution to agitate and circulate solutions in tanks and vats, has been announced by The Youngstown Welting and Engineering Co., Youngstown, Ohio.

Welded into one piece, the jet combines a special nozzle and a bell-shaped housing. In operation, the air, liquid or steam increases in velocity as it passes through the nozzle and expands into the bell-shaped housing. This action sucks solution from the tank through the back of the jet so that the solution at the side and back of the jet is agitated and circulated as well as is the solution in all other parts of the tank.

The jet is installed in the corner or anywhere along the sides of a tank and connected to air, liquid or steam line. It can be used on any line which has 10 pounds of pressure or more.

Designated as the *Weldco jet*, the unit can be made of Monel, Inconel, Nickel, stainless steel, or any alloy of weldable material.

Fire-Resistant Paint

A paint designated as *Fi-Repel*, has been announced jointly by the General Detroit Corporation, 2270 East Jefferson Avenue, Detroit 7, Michigan, and the General Pacific Corporation, 1800 South Hooper St., Los Angeles 21, California. Endorsed by Underwriters' Laboratories and other testing bureaus, the paint protects wood and other materials against fire hazard.

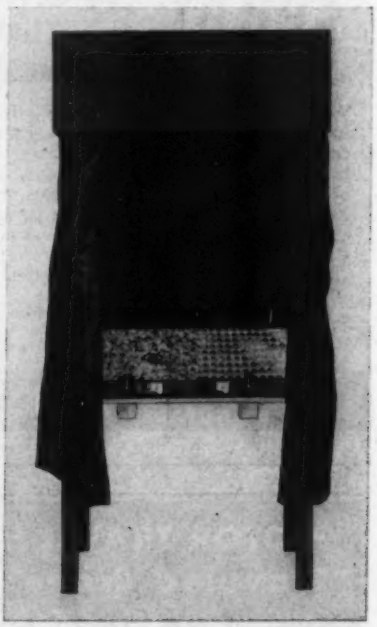
The paint is shipped as a concentrated paste. After dilution, it can be applied with a brush or spray gun. One concentrated gallon at standard dilution will cover as much as 185 square feet with two coats.

Standard color is bone-white, but tints may be easily added.

The paint is available in one-gallon, five-gallon, and 55-gallon containers.

Precision Instrument for Surface Inspection and Comparison

Rex D. McDill, 5107 Mayfield Road, Cleveland 21, Ohio, has announced a comparator projector (Model C-1000) for use in comparing two surfaces at 100 diameter magnifications by Faxfilm. (Faxfilm is a method by which an exact replica



of a surface is made in clear plastic in less than a minute's time.)

The comparator apparatus is a complete projection booth containing twin micro-projectors. With this device, images of the two Faxfilm slides at 100 diameter magnifications, each 20 in. square, appear side by side on an inspection table about six inches away from the apparatus. This feature permits fine adjustments in focus to be made by observer while standing at inspection table.

The comparator apparatus requires about the same floor space as an average desk.

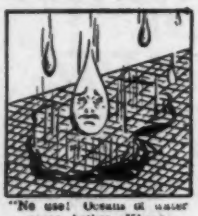
Concrete Floor Surfacing Material

A. C. Horn Company, 43-46 Tenth St., Long Island City, N. Y., has announced *Ferem* as a concrete floor surfacing material containing all the desirable characteristics of hardeners, admixtures and processed components. Requiring only the addition of cement and water, Ferem is used in heavy duty floors whether in newly constructed buildings or when patching, resurfacing or relaying worn and eroded floors.

If Your Floors Could Talk!

They would say "Protect us against *all* assaults, with KLEMP Hexteel!"

"Can't make a crack in it. Must be Klemp Hexteel!"



"No use! Oceans of water never bother Klemp Hexteel!"

"This Klemp Hexteel floor is sure on the level! I can't knock it out!"

KLEMP HEXTEEL

HEAVY DUTY SURFACE ARMOR

Can Take It!

Whether your floors are *old or new* wood, concrete, or any material, Klemp Hexteel can easily be laid over them, and filled flush with concrete, asphalt or mastic. Enduring steel mesh provides solid, level, one-piece floor that withstands *the worst* of pulp and paper mill usage.

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KEEP YOUR BELTS RUNNING

1. Inspect your belts and fastenings frequently.
2. If you find that the lacing is badly worn and the belt joint is badly frayed or worn relace the belt with Alligator Steel Belt Lacing.
3. Don't throw worn belting away. Worn belting can be reconditioned or you can easily make up a serviceable belt by cutting out the best sections of old belts and then splicing them together with Alligator Steel Belt Lacing.
4. Be sure and use the size of Alligator Steel Belt Lacing recommended for the thickness of belt to be spliced.
5. Where belts are to be laced that are wider than the standard lengths of 6, 8 or 12 inches, Alligator Belt Lacing is available in continuous lengths for any width of belt. The continuous length is easier to apply and makes a more uniform and longer lasting joint.
6. Write for our Bulletin A-60 that gives complete details on how to lace flat belts of leather, rubber, balata, canvas, from 1/16" to 5/8" thick and as wide as they come.

JUST A HAMMER TO APPLY IT

● Lacing can be applied right at the location of the belt without even taking the belt off the line shaft. Alligator has strength with long life, compression grip, is smooth on both faces and the joint is easy to take apart at any time regardless of the amount of wear.

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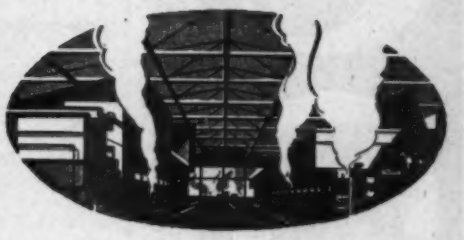
ALLIGATOR

STEEL BELT LACING

For more than 30 years the most universally used steel belt lacing in the world

YOU CAN PUT THIS ON PAPER

Wolmanized Lumber Lasts Longer*



Pulp mill structures, paper mills, and all wet process plants— built of ordinary lumber and materials—are inevitably subject to rapid deterioration. Roof planks and timbers, window frames and sash, floors and walls cannot withstand the steam and chemical-laden vapors . . . for long. Wolmanized Lumber, the wood impregnated with Wolman Salts* preservative, is highly resistant to this two-way attack. Wolmanized Lumber lasts three to five times longer!

The advantages of building with wood

Building with wood means ease and speed of erection, light weight, resilience, high insulating value, paintability, low first cost and . . . when Wolmanized . . . long life.

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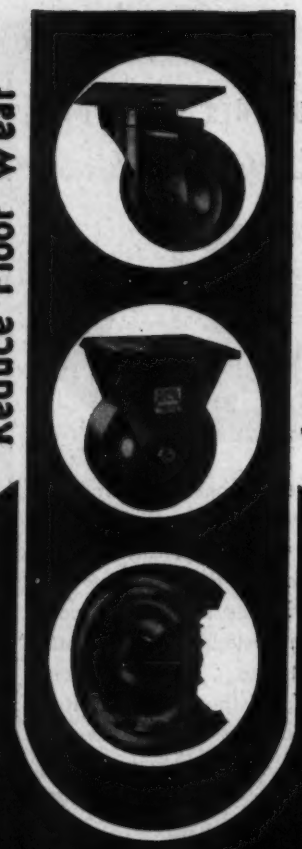
Increase efficiency



. . . Let us demonstrate how Darnell Casters and E-Z Roll Wheels will save money and increase efficiency

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FOR NEW DARNELL MANUAL

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The principal component of Ferem has a rating of nine in hardness on the Mohs scale, only one point less than the diamond. According to the manufacturer, floor toppings with this material have approximately four times the compressive and tensile strength of ordinary cement topped floors.

Power-Driven Stiffness Gauge

The Taber Instrument Corporation, North Tonawanda, N. Y., has announced a new Taber V-5 power-driven stiffness gauge. Designed for determining standard measurements of the stiffness and resilient qualities of such flexible materials as laminated plastic, paperboard, light metallic sheet and wire in thickness up to 1/8 in., the instrument utilizes a calibrated weighing system of the pendulum type. It is furnished with a set of calibrated weights of 500, 1,000, and 2,000 stiffness units. Weights of 3,000 and 5,000 stiffness units also are available.

An attachment is provided for measuring the flexual strength of very thin and flexible materials below 10 units stiffness.

The gauge weighs 15 pounds. It can be plugged into any 115 volt, 60 cycle circuit.

Label Adhesive and Overcoating

The "Resyn" Division, National Adhesives, 270 Madison Ave., New York 16, N. Y., has announced *Resyn Adhesive* Q3605 as a solvent-free synthetic resin emulsion for adhering labels to "V" board, wood, and other products, and as waterproof overcoating for them.

The adhesive, complying with current Government specifications (such as AXS-1472), is supplied in cold liquid form and can be diluted with water. It can be applied by brush or gumming machine, is very fast setting and dries tack-free—even under high humidity conditions.

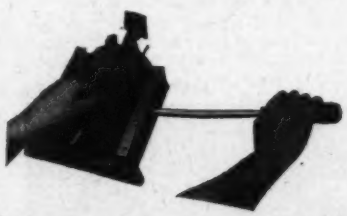
When used as an overcoating, the emulsion breaks immediately, depositing a waterproof, transparent resin film on the surface. It neither clouds nor smears printing inks and is highly resistant to abrasion.

FAST DELIVERY ON "SHAF-TITE" ROLLS
FOR WET FELTS
plus patented features that give greater value.
Write for Catalog!
RODNEY HUNT MACHINE COMPANY
38 Maple Street, Orange, Mass., U.S.A.

Cable and Wire Stripper

Ideal Commutator Dresser Company, 4162 Park Ave., Sycamore, Ill., has announced a device for stripping rubber insulation, asbestos, synthetic, glass, cambric and other insulations from any length of wire or cable up to 3/8 in. diameter.

Plain blades are used for stripping parallel wire, heater cord, inner conductors, and POSJ cord; grooved blades, for rubber covered and weatherproof cable.



Among the important features of the stripper, cited by the manufacturer, are the following: straight line pull prevents scraping and nicking of wire; jaws automatically center and grip any diameter wire—no manual adjustment necessary; jaws instantly release wire at end of stripping stroke; blades open automatically to receive wire when lever is pushed forward; blades are quickly interchangeable; adjustable stop provides for length of stripping—can be removed when extra long stripping is desired.

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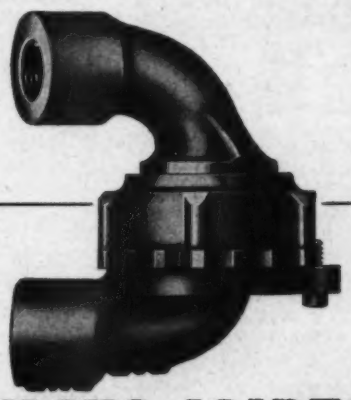

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Cymene Produced from Sulphate Turpentine

In 1931, laboratory experiments showed that it was feasible to convert sulphate turpentine into cymene. The primary requirement was a suitable catalyst for converting the terpenes. Initially, a very active form of carbon impregnated with ammonium pyromolybdate was used. This gave good results, but it was soon found that activated carbon alone was a sufficient catalyst.

Later it was found that the process could be cheapened further by using a less active carbon. The life of this catalyst also proved adequate. Ordinary charcoal however, was not suitable. It could be activated by means of air and superheated steam in a contact apparatus. Although this type of carbon is gradually poisoned, it can be reactivated in the above manner. In the experiments described, that fraction of the turpentine which boiled between 172-182 C. was usually used and this gave yields of over 95% cymene. This result was far more satisfactory than when unfractionated turpentine was used, or than when the so-called pinene fraction was treated. In such cases, the yield was lower and rate of catalyst poisoning was far greater. When the raw cymene was treated with concentrated sulphuric acid and distilled, it yielded about 65% toluene.

In 1939, semi-commercial experiments based on these laboratory runs were carried out at the sulphate mill at Ljusnan, and a commercial plant with a possible annual output of 200 tons of cymene was constructed there. Successful trial plant runs were made, but because of raw material difficulties, plant operations never got under way. Diagrams are given both of the laboratory and plant equipment, and tabulated laboratory data are also given. Hilding Bergström, K. N. Cederquist, and K. G. Trobeck. Svensk Papperstidn. 48, No. 10, 246-9 (May 31, 1945) through Bull. Inst. Paper Chem. 15, No. 11, 404 (1945).

Vulcanized Fiber

Vulcanized fiber is a converted cellulose hardened by treatment with zinc chloride into a tough, resilient, hornlike plastic which has high mechanical strength and good electrical properties. It also has high resistance to wear and abrasion, high durability and is light in weight.

In the last decade these properties of the fiber (which have been known for many years) have been advantageously exploited. The fiber can be bent, formed and drawn. In forming it, the first stage involves immersion in water to effect softening, or treatment in a chamber with live steam. The immersion time varies with the shape into which the fiber is to be formed. When subjected to pull, the wet fiber will stretch as much as 25%. It will compress or "crowd" as much as 50%. When removed from the water or steam, the fiber is placed in a heated metal die and kept under pressure until enough water has evaporated to permit the fiber to hold its shape. This time period is brief. It may involve a few seconds, and it is not longer than 6 minutes. Below 250° Fahr., the fiber has no thermoplastic properties. However it becomes thermoplastic at 325° to 450° Fahr. and can be bent into simple shapes.

On the other hand, the amount of draw or bend obtainable under heat alone is far less than when the fiber is wet. When the fiber is once formed its dimensions are stable, at least under normal atmospheric conditions. On the other hand when exposed to high humidities, the fiber absorbs water. In general this can be controlled by the use of suitable lacquers. G. A. Albert. Modern Plastics 22, No. 7, 124-5, 202 (March 1945) through B.I.P.C. 15, No. 9, 354 (1945).

Physical and Chemical Properties of Polythene Resin

This hydrocarbon resin recently became available commercially from domestic sources. Its low electrical losses coupled with its great resistance to moisture and chemicals and its toughness over a wide range of temperature, has led to wide utilization, especially in the electrical field. These properties indicate other potential uses. As a means of protecting metal surfaces from corrosion and in the application of polythene generally, the process of "flame-spraying" the powdered material is used and described.

The low moisture permeability and good water resistance indicate its suitability in coating cloth, paper, etc., in the fabrication of containers for liquids, and in packaging in general. The plastic can be applied either as sheeting or as an impregnant for paper. Twenty-two references are given. F. C. Hahn, M. L. Macht, and D. A. Fletcher, Ind. Eng. Chem. 37, No. 6, 526-33 (1945).

Evaluation of Analytical Filter Papers

The standard method for determining the ash content of paper was not sufficiently accurate when applied to filter paper. Here the wetted paper was pressed into a small wad and the tared crucible was kept as small as possible. Other tests were the bursting strength of wet paper, thickness, weight per unit area, alpha-cellulose content, copper number, and pH. The last three determinations are of importance in gaging the purity of the cellulose and the stability of acid-washed papers because instances of deterioration of such papers had been observed. Acid may result in causing brittleness in the paper and in forming modified cellulose which may be soluble in certain solutions.

In measuring the rate of flow of water through filter papers, complicated apparatus was avoided by applying Darcy's law to the ordinary conical filter. However, prefiltered water had to be used to insure reproducibility. The investigation was made to assist in the development of standards of quality, retention of fine precipitates, etc. B. W. Scribner and W. K. Wilson J. Research, National Bureau of Standards, 34, No. 5, 453-8 (May, 1945).

Recovery of Fermentation Residues

The stillage from fermentation of grains retains large amounts of proteins and unfermented sugars. By treating this mixture with sulphite waste liquor in relatively small amounts, about 85% of the proteins can be recovered in the precipitate which can be readily filtered. This facilitates the subsequent evaporation and concentration of the stillage. The feed value of the "protein-lignin" was found equal to that of its protein content. The taste is palatable. After this product is removed, the filtrate still retains carbohydrate material which, while not fermentable, serves as nutrient for *Torula utilis* yeasts, which are also high in protein and are good feedstuffs. Thus the stillage is largely utilizable, has a high nutritive value and when discharged shows less than half of its original biological oxygen demand (*i.e.*, has lowered stream pollution). E. Farber, G. D. Maengywyn-Davies and J. S. Wallerstein. Chem. Eng. News 23, No. 7, 617-9 (April 10, 1945).

Nickel-Plating of a Yankee Cylinder

A Swedish mill was forced to use process water contaminated with sea water and thus experienced serious corrosion difficulties. In the case of a Yankee dryer, these were solved by electroplating with nickel. Special apparatus and methods had to be used, and the actual plating required six days, whereas the preliminary work and finishing each took about the same length of time. The nickel layer was quite heavy. There was no polishing because the doctors were expected to give the right finish. When the article was written, the nickel-plated cylinder had been in operation about a month, without showing the slightest sign of corrosion. Furthermore, the unpolished nickel surface imparted a gloss to the paper that had been unobtainable previously with cast iron surfaces. Patents have been applied for. Anon. Svensk Papperstidn 48, No. 10, 249 (May 31, 1945); through Bull. Inst. Paper Chem. 15, 405-6 (1945).

Tall Oil Nomenclature

The author defines in Swedish and gives English equivalents for sulphate soap, tall oil, tall light oil, tall fatty acids, tall rosin acids, etc. These terms have been adopted by the Swedish Patent Office and the Tariff commission. Svensk Papperstidn. 48, No. 6, 139-40 (1945).

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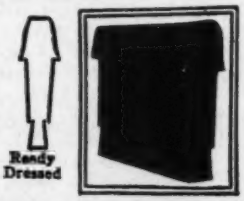

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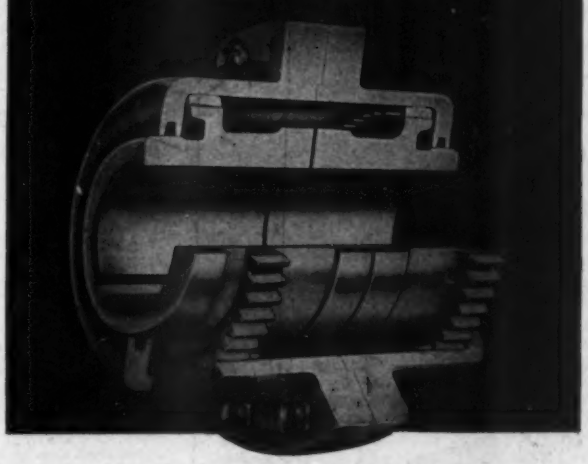

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PAPERMAKING PATENTS

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Papermaking Method and Apparatus

Patent No. 2,355,391. Robert F. Nelson, Ardmore, and John N. Tuttle, Philadelphia, Pa., assignors to The Glassine Paper Company, West Conshohocken, Pa., a corporation of Delaware. Application July 27, 1940. Serial No. 347,866. 9 Claims. (Cl. 34—4).

5. The method of making paper comprising drying a sheeted web of paper by passage between heated drums and at least one felt, and subjecting said felt to infrared radiation to substantially in the range of 6500 to 14,000 Angstrom units to effect drying thereof.

Apparatus for Coating

Patent No. 2,344,232. John Campbell and Kenneth Austin Taylor, Glens Falls, N. Y., assignors to International Paper Company, a corporation of New York. Original application December 12, 1940, Serial No. 369,778. Divided and this application August 12, 1942, Serial No. 454,496. 4 Claims. (Cl. 91—53).

1. A doctor blade for use in conjunction with paper coating machines comprising a body having a surface treated to present a low affinity for coating composition, said surface being formed on a convex web-contacting portion of said blade, the radius of curvature of said web-contacting portion being not less than 3/16 in. and not greater than 1 in., said web-contacting portion terminating in an intersection with a plane disposed radially to said web-contacting portion.

Paper Coating

Patent No. 2,355,065. Herbert F. Gardner, Chicago, Ill., assignor to Stein, Hall Manufacturing Company, Chicago, Ill., a corporation of Delaware. No Drawing. Application August 3, 1940. Serial No. 351,099. 6 Claims. (Cl. 106—205).

3. A paper coating color comprising a coating pigment and containing as the predominant adhesive component a low soluble white starch gum having a solubility within the range of about 1% to about 20% in water at 25° C. and a viscosity characteristic such that it will give a viscosity reading of 30 seconds on a Stormer viscosimeter using a 500 gram weight and the high viscosity cup when dispersed in water in proportions within the range of 1 part of said starch gum to 2-7½ parts of water with heating to 190° F. followed by cooling and testing at 75° F., and said starch gum being obtainable by roasting a starch under substantially dry conditions at temperatures within the range of 350° F. to 450° F. in the presence of not more than 0.1% of a non-dehydrating acid based on the weight of the starch for a period less than that at which the color change from white to brown normally occurs.

Diatomaceous Earth Fillers for Papermaking

Patent No. 2,366,400. Milo A. Harrison, Hermosa Beach, Calif., assignor to The Dicalite Company, Los Angeles, Calif., a corporation of Nevada. No Drawing. Application September 21, 1942, Serial No. 459,224. 2 Claims. (Cl. 106—288).

1. A filler for paper consisting substantially of finely comminuted, calcined diatomaceous earth having intrinsically an alkaline reaction, in intimate intermixture with a powdered, solid, acid substance in quantity sufficient to neutralize the alkalinity of said earth when said mixture is introduced into an aqueous medium.

Purification of Pulp

Patent No. 2,353,983. Hellmuth Banning, Duren, Rhineland, Germany; vested in the Alien Property Custodian. Application March 7, 1938. Serial No. 194,265. In Great Britain, March 10, 1937. 3 Claims. (Cl. 233—46).

1. A centrifugal separator for the purification of paper-, cellulose- or wood-pulp from impurities comprising at least one drum with a bottom, an annular flange on said drum above said bottom, said flange extending interiorly of the drum for the formation of a deposit of fibres holding heavy impurities in the space below said flange an annular body arranged on said drum above said flange, said annular body having a wall the lower portion thereof extending in a substantially vertical direction and the upper portion thereof extending in an upwardly and inwardly inclined direction, the upper edge of said annular body forming an overflow edge and being nearer to the axis of the drum than the innermost edge of said annular flange, and an annular member disposed inside said annular body, the outer surface of said annular member being spaced from the inner surface of the wall of said annular body to form a throttling passage for the discharge of the entire flow of the purified material, the upper edge of said annular member extending beyond the upper edge of said annular body, and the inner surface of said annular member forming skimming means for the separation of the light impurities.

Thin Stock Regulator

Patent No. 2,353,149. Hervey G. Cram, Appleton, Wis., assignor to The Cram Company, Inc., Appleton, Wis., a corporation of Wisconsin. Application October 25, 1941. Serial No. 416,480. 4 Claims. (Cl. 137—78).

1. A consistency responsive apparatus for thin pulp or stock comprising a body having an inlet opening for pulp and a discharge opening for pulp, a rotary cylinder in said body between the inlet opening and the discharge opening so constructed and arranged that on rotation about its axis liquid passes therethrough at right angles to its axis and solid matter collects on its periphery at a rate depending on the consistency of the stock, and a transversely extending partition in said body between the cylinder and the bottom of the body so arranged as to prevent the passage of pulp between the cylinder and body whereby to hold back the pulp on the inlet side of the body in accordance with the consistency of the stock.

Paper Machine Flow Mixer

Patent No. 2,354,007. Philip H. Goldsmith, Wilmington, Del. Original application September 27, 1938. Serial No. 231,854. Divided and this application May 9, 1941. Serial No. 392,717. 2 Claims. (Cl. 92—43).

1. In a cylinder paper machine of the type wherein a portion of the paper stock supplied to the forming surface of said machine is continuously recirculated and wherein said recirculated stock is diluted with white water and mixed with fresh stock coming to said machine, apparatus for mixing said diluted stock and said fresh stock comprising, in combination, a conduit for said diluted stock having a portion of gradually diminished cross-sectional area to momentarily increase the rate of flow of said diluted stock therethrough, and a second conduit for said

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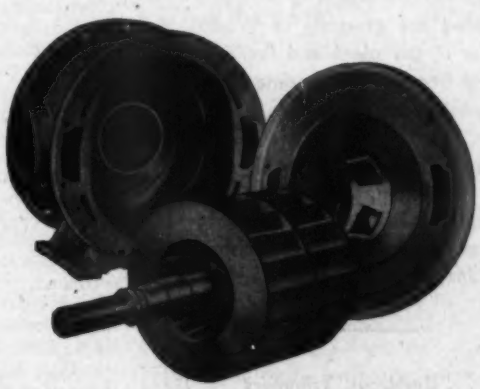

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fresh stock connected to said first conduit approximately at the point of minimum cross-sectional area of said first conduit, said second conduit having a gradually diminished cross-sectional area at the point of junction with said first conduit to increase the rate of flow of said fresh stock at said point of junction, whereby said fresh stock and diluted stock are intimately mixed to form a homogeneous stock supply for said machine.

Mounting Tissue

Patent No. 2,358,135. Allen Abrams and George W. Forcey, Wausau, Wis., assignors to Marathon Paper Mills Company, Rothschild, Wis., a corporation of Wisconsin. No Drawing. Application November 30, 1942, Serial No. 467,464. 7 Claims. (Cl. 117—122).

1. A mounting tissue for photographs and printed matter comprising a cellulosic base sheet carrying a uniformly distributed hot-melt composition at both surfaces thereof comprising ethyl cellulose from about 15 to about 50% by weight, a plasticizer from about 15 to about 50% by weight and a compatible non-volatile solvent from about 20 to about 60% by weight.

Coating Apparatus

Patent No. 2,356,873. Gerald D. Muggleton, Appleton, Wis., assignor to Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis., a corporation of Wisconsin. Application January 27, 1941. Serial No. 376,027. 2 Claims. (Cl. 91—33).

1. A device for coating paper which comprises a rotating coating roll, means for continuously applying a coating material to the surface of said roll, a rotating bed roll in substantially osculating relationship with said coating roll, said rolls rotating in opposite angular directions, means for passing a web of paper into the nip of said rolls in the direction of rotation of said roll surfaces whereby a portion of the coating material carried upon the coating roll is transferred to a surface of the web, means for supporting said web upon said bed roll, a coating stripping blade position adjacent the exit side of said nip, said blade having an edge in contact with said coating roll to strip coating material from said coating material and apply the same to said web, and means carried by said stripping blade for smoothing said coating on said web while the same is supported upon said bed roll.

Jordan Engine Lining

Patent No. 2,366,367. Harold D. Stuck, Andover, Mass., assignor to John W. Bolton & Sons, Inc., Lawrence, Mass., a corporation of Massachusetts. Substituted for abandoned application Serial No. 374,718, January 16, 1941. This application July 26, 1944, Serial No. 546,602. 4 Claims. (Cl. 92—27).

1. In a bodily transportable Jordan engine shell lining; the combination of a frusto-conical plate of tough bendable metal through which are a plurality of rows of holes which extend through the plate, each hole having sides formed to serve as holding parts; with a plurality of bars each of a hard metal and each of which has a plurality of holding portions along one edge, each of which holding portions extends into a hole in the plate, the part of the bar between the holding portions resting on the plate between the holes; and hardened molded cast metal of a kind which melts at a temperature so low that it will not affect the temper of either the bars or of the plate, which metal substantially fills each hole in the plate and engages the holding portion of each bar and the holding part of the hole in which such holding part of the bar is positioned.

Wrapping for Commodities

Patent No. 2,367,563. William H. Bryce, Memphis, Tenn. No Drawing. Application August 7, 1941, Serial No. 405,882. 3 Claims. (Cl. 117—155).

1. A moisture-vapor-proof wrapper for commodities having heat sealing qualities which comprises a sheet of glassine paper treated with an aqueous solution of anhydrous dextrose and glycerine, coating the so treated paper with a melt containing a major amount of paraffin wax and minor amounts of synthetic rubbery polymerized isobutylene and unmilled thermoplastic rubber derivative prepared by the treatment of rubber with a halide of an amphoteric metal and said melt being applied in a molten state free from volatile solvents.

◆

Bituminous Emulsion Developments for Weatherproof Boards

(Continued from page 778)

stable to heat and acids required for catalyzing. The extension is made by simple admixture to a finished adhesive and results in both a reduction and cost and improvement of waterproofness in the glue line.

In the general current practice, 40% by volume of the bituminous emulsion extender is added to 60% by volume of either the starch-urea formaldehyde resin or the polyvinyl alcohol types of adhesives. In both instances, this effects a material increase in the weight of solids per extended gallon. This is the result of the initial high solids content of the bituminous emulsion which is approximately 60% by weight.

The finished combined solids of a bituminous emulsion extended starch-urea glue line will average in general between 4 and 8 pounds per thousand square feet of single glue line, in which the bitumen component is roughly 50%. The finished combined solids of a bituminous extended polyvinyl glue line will average between 2 and 4 pounds per thousand square feet in which the bitumen component is approximately 66%. It will be seen from this that the asphalt component of the glue line is only 2 to 4 pounds per thousand square feet of area. Waste and trim from paster operations in this case also, can be returned to the paper mill for repulping without the difficulties or loss of fiber stock as in hot asphalt duplex liners where glue line weights average between 20 and 30 pounds of asphalt per thousand square feet of single glue line.

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American K. A. T. Corporation, 331 Madison Avenue, New York 17, N. Y—Up-to-date information on water treatment is provided in Bulletin No. 33, entitled, "The Modern Way to Avoid Boiler Troubles." It will be of special interest to paper products manufacturers.

Askania Regulator Company, 1603 South Michigan Avenue, Chicago 16, Ill.—Now made available to the general public by this company is Technical Paper No. 100, "Process Control Terms," prepared by the chief engineer, H. Ziebols, for members of their own staff. It contains the proposed A. S. M. E. definitions for process control terms, along with pictorial interpretations, and should be a valuable handbook for both suppliers and users of such controls.

Calco Chemical Division, American Cyanamid Company, Bound Brook, N. J.—The release of their latest Technical Bulletin No. 773, entitled "Statistical Analysis of Test Data," by E. I. Stearns, of its research department has been announced by this company. Originally presented as one of a series of lectures to the scientific and supervisory personnel at the Bound Brook plant of the company, it is intended to arouse interest in statistical methods for quality control in production and the analysis of experimental data. It is instructive in pointing out fields of application, but does not include detailed mathematical methods. A copy may be obtained from any Calco representative, or by addressing a request to the Advertising Department, Calco Chemical Division, Bound Brook, New Jersey.

The Deming Compay, Salem, Ohio.—A new booklet just issued by this company, "Facts You Should Know About Centrifugal Pumps and Impellers," is a textbook on centrifugal pumps. It contains basic information about various standard types of such pumps.

Electric Machinery Mfg. Company, Minneapolis 13, Minn.—Just issued by this company is a new 20-page fact-filled booklet that explains the power factor in detail entitled, "The A-B-C of Power Factor." The booklet is well illustrated, fully authentic, and printed in three colors. The application of synchronous motors for uses in pulp and paper mills is explained. An unusual feature is the diagrammatic index showing plant power factor improvement with synchronous motors and capacitors.

Foote Bros. Gear and Machine Corporation, 5225 South Western Boulevard, Dept. NR, Chicago 9, Ill.—Just released by this company is a new Bulletin No. AQA2, which presents complete engineering data, comparative performance curves, design details, operating speeds and other data on the "AQ" (Aircraft Quality) gears developed by this company.

The General American Process Equipment Division, General American Transportation Corporation, Louisville Drying Machine Unit, 420 Lexington Avenue, New York 17, N. Y—This company has announced another of their series of bulletins on dryers. Bulletin No. 514-A Grabar Building, New York 17, covers the Louisville Direct Heat Rotary Dryers. Both counter-current and parallel-current dryers are discussed and illustrated.

The B. F. Goodrich Company, Akron, Ohio—Now available on request is a catalogue section on its all-synthetic rubber gloves and plastic treated industrial apron. A page of illustrations shows how to get the most service at the lowest cost from acid and industrial rubber gloves. Another catalogue section describes its recently introduced charger for its wet rechargeable flashlight batteries which can be operated from the ignition system of automotive vehicles. The functions of the charger and the methods by which it may be attached to the vehicle are also given.

The Jeffrey Manufacturing Company, Columbus, Ohio.—A well illustrated directory of its products has just been released by this company. Special attention has been paid to the needs of pulp and paper mills. Ask for Booklet 733-A.

Towmotor Corporation, Cleveland 10, Ohio—Now offered free to any one interested in locating and analyzing handling problems is a new "Materials Handling Analysis Guide." The 36-page pocket-size booklet, which discusses handling from an executive viewpoint, is divided into three major sections: (1) How To Tell If You Need Better Handling Methods; (2) Analyzing the Problem, and (3) Determining the Solution to your Problem. There are 31 clever sketches which help to point out ways of improving handling methods. All the well-known types of power-handling equipment are illustrated and discussed. The bulletin may be obtained by writing on company letterhead to the above address.

United States Stoneware Company, Tallmadge Circle, Akron, Ohio—Just released by this company is Bulletin H, describing briefly some of the corrosion-resistant materials and equipment now available. Charts showing sizes and formulations are added to photos and sketches to make the Booklet more helpful.

Whiting Corporation, Harvey, Ill.—Just off the press is a new catalogue bulletin issued by the Swenson Evaporator Company, Division of the Whiting Corporation, covering their line of vacuum crystallizers. The eight-page bulletin is illustrated with installation photos and drawings. Applications and advantages of these crystallizers are clearly shown. Sizes and capacities; construction and operation, are all explained in the attractive two-color bulletin.

Worthington Pump and Machinery Corporation, Harrison, N. J.—A new circular, Bulletin W-204-B10, just issued by this company, illustrates its low level jet condensers, mounted on horizontal single wet vacuum pumps. Charts with information on ratings and dimensions are included. Also available from this company is Bulletin WP-1099-B43, "Industrial Application of High Pressure Hydraulic Nozzles." Photos, charts and schematic layouts are used in this attractive booklet. The use of hydraulic jets for debarking logs is also explained. In a third bulletin, No. RP-269,453, "Steam-Jet Thermocompressors Supply Intermediate Pressure Processes," information is given on the use of this device, together with charts and tables. All three booklets are available upon request.

Yeomans Brothers Company, 1433 North Dayton Street, Chicago 22, Ill.—Of special interest to paper and pulp mills will be Bulletin 1011, issued by this company, describing its Type "SHB" ball and sleeve bearing centrifugal pumps. Photos and diagrams illustrate the circular.

Books

The Chemical Formulary (Volume VII)—This book becomes a companion of the previous six volumes. Containing additional new formulae, the work is divided conveniently into 21 chapters. Among the chapters are the following: Adhesives; Emulsions and Colloids; Inks and Marking Substances; Lubricants and Oils; Materials of Construction; Metals and Alloys; Paint, Varnish, Lacquer and Other Coatings; Paper; Photography; Plastics, Resins, Rubber, Wax; Soap and Cleaners; Textiles and Fibers; and Miscellaneous.

H. Bennett is editor-in-chief of the work; Chemical Publishing Co., Inc., 26 Court Street, Brooklyn, N. Y., the publisher. The price of the book is $6.00 a copy.

Time Study and Motion Economy for Supervisors—Dedicated to the disabled veterans of World War II, this book by James D. Shevlin has been published by National Foremen's Institute, Inc., Deep River, Conn. The contents are divided broadly into three parts: Motion Economy, Time Study, and Charts and Diagrams. Among the subjects discussed in reference to motion economy are: Preposition Tools and Materials, Proper Work Areas, Gravity Feed Hoppers, Drop Delivery Chutes, Balance Both Hands, Holding Devices, Foot Pedals and Chair, and Sell the Proposed Method. Similarly, in reference to time study, among the subjects considered are: How a Time Study is Made, The Foreman and Time Study, The Foreman—Before, During and After Time Study, Time Study and Cost Reduction, The Worker's Pay Check, and Ten Commandments of Better Methods. The material on charts and diagrams consists primarily of the presentation of four Otis charts; namely, breakdown, hand, map, and crew, designed for the analyzing of any job. These charts are presented in duplicate, first in each instance being used to show the present method; the second, the proposed method. The price of the book is $2.00 a copy.

Training for Supervision in Industry—George H. Fern, the author of this volume, in his preface, states that the book is intended to give direct help to the supervisor with the problems of his daily job, especially in the fields of human relations and training. The text is dividend conveniently into the following chapters: The Supervisor and His Job; The Importance of Mental Health to Industry; Safety and Accident Prevention; Women in Industry; Starting a New Worker Right; Supervisors and Job Relations; How to Analyze Jobs; How to Lead a Conference; Training Conference Discussion Topics and Analyses; The Supervisor as an Instructor; and Training Opportunities Today.

Mr. Fern is Director, Michigan State Board of Control for Vocational Education and State Director, War Production Worker Training and Food Production War Training; also Vice President, Industrial Education, American Vocational Association, Inc.

The book, priced at $2.00 a copy, is published by the McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 18, N. Y.

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CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

OPA ceiling prices in sales to consuming mills delivered buyer's usual receiving point, with brokers' allowance not in excess of 5 per cent.

	per cwt.
Blue Overalls	-5.50
Corduroy, Men's	-3.50
Corduroy, Ladies'	-3.00
Washables, No. 1	-3.00
Percales	-4.75
New Soft Blacks	-3.75
Light Prints, No. 1	-4.50
Khaki Cuttings—	
Bleachable	-4.25
Unbleachable	-3.50
New White Canvas	-6.50
New Mixed Blacks	-3.25
Canton Flannels, Bleached	-7.00
Shirt Cuttings—	
New White No. 1	-7.25
No. 1 White Heedings	-7.25
White Shrunk	-5.00
Silesias No. 1	-5.75
New Unbleached	-7.50
Fancy	-3.50
Linen Cuttings—	
American	-5.00
White	-14.00
Grey	-14.00

RAGS (Domestic)

f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowance of $1 to $2 a ton depending on the value of the grade involved.

Roofing—	per ton
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
Whites, No. 3—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shapperies	

ROPE and BAGGING

f. o. b. and ex dock New York City

Gunny No. 1—	per cwt.
Foreign	Nominal
Domestic	3.15 to 3.40
Wool Tares—	per cwt.
Light	3.75 to 4.00
Heavy	4.00 to 4.25
No. 1 Scrap Bagging	2.75 to 3.00
Manila Rope—	
No. 1 large	-*115.00
No. 1 small	-*105.00
Sisal Rope—	
No. 1 large	-*95.00
No. 1 small	-*80.00
New Burlap Cuttings	5.50 to 6.00
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
No. 1 sisal	-*80.00
No. 2 sisal	-*60.00
Soft jute	5.00 to 5.50
Mixed	1.75 to 2.00

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER

OPA ceiling prices f. o. b. points of shipment for machine compressed bales weighing not less than 500 pounds (with differential of $5 per ton less on certain grades for loose or bundled stock), and brokers' allowance of 4 to 9 per cent.

Shavings—	per ton
White Env. Cuts, One-Cut	67.50-
Hard White Env. Cuts	62.50-
Hard White, No. 1	57.50-
Soft White, No. 1	50.00-
Soft White, One-Cut	57.50-
Soft White, Misc.	43.00-
Fly Leaf, No. 1	33.50-
Fly Leaf, Woody, No. 1	25.00-
No. 2 Mixed Col. Woody	18.00-
Flat Stock—	
No. 1 Heavy Books and Magazines	38.50-
Mixed Books	22.00-
Ledger Stock—	
No. 1 White	46.00-
No. 1 Mixed (Colored)	40.00-
Manilas—	
New Env. Cuttings	53.00-
New Env. Cuts, One-Cut	57.50-
Extra Manilas	39.00-
Manila Tab Cards, Free of Ground Wood	45.00-
Ground Wood Manila Tab Cards	27.00-
Kraft—	
Envelope Cuttings	45.00-
Mixed Env. or Bag Cuts	55.00-
Tripled Sorted No. 1 Brown	50.00-
New 100% Cor. Cuts	45.00-
No. 1 Old Assorted	35.00-
News—	
White Blank	33.00-
Oversizes	22.00-
No. 1 Baled	20.00-
Old Corrugated Containers	28.00-
New Corrugated Cuts	18.00-
Mill Wrappers	22.00-
Box Board Chips	14.50-
No. 1 Mixed Paper	19.00-

CHEMICALS

f. o b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	06.00 to —
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	24.00 to 24.75
80-100 mesh (bags), lb.	—
Argentine, lb.	18.00 to 20.00
China Clay—	
Domestic Filler Bulk (mine) ton	9.50 to 16.00
Domestic Coating Bulk (mine) ton	11.00 to 22.00
Imported (ship side) Bulk (lump) ton	14.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	17.25 to 17.75
Litharge, powd., bbl., lb.	.09 to —
Rosin (Gum)—	
New York, per 100 lbs.	
E	6.75—
F	6.85—
G	7.00—
WW	8.00—
Rosin (Wood), carlots	5.25—
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	20.00 to —
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30-
Ground and flake, drums, cwt.	2.70 to 2.95
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.75-
Pearl, barrels, cwt.	3.85-
Paper (Sp.) bags, cwt.	3.85-
barrels, cwt.	3.95-
Sulphur (Crude)—	
(Mine) bulk, long ton	16.00 to—
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 21.00
Imp. bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	5.60 to 5.85

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo. (West of the Continental Divide and in Denver, Colo., ceilings are $6 per ton lower):

Bleached softwood sulphite	86.00
Unbleached softwood sulphite	74.00
Bleached hardwood sulphite	83.50
Unbleached hardwood sulphite	71.50
Northern bleached sulphate	86.00
Southern bleached sulphate	79.00
Northern semi-bleached sulphate	82.00
Southern semi-bleached sulphate	75.00
Northern unbleached sulphate	72.00
Southern unbleached sulphate	63.50
Bleached soda	76.00
Unbleached soda	72.00
Ground wood pulp	50.00
Ground wood—paper machine dried and mutilated	58.00
Sulphite screenings	43.50
Sulphate screenings	38.00
Ground wood screenings	32.00
Northern unbleached sulphate sideruns	73.00
Southern unbleached sulphate sideruns	63.50
Standard news print sideruns	50.00

PAPER

f. o. b. New York City

Boards—	per ton
Binders	84.00-
Chip	50.00-
Chip, tube and can	52.00-
Chip, full-blending	54.50-
Chip, sgl. mia. lined	62.00-
Coated, white patent .016	80.00-
.020 and heavier	75.00-
Kraft liner	62.00-
News	50.00-

Book Papers—OPA base maximum prices per cwt. 4 cases or equivalent, f. o. b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	8.25
B Grade E. F.	7.80
C Grade E. F.	7.55
D Grade E. F.	7.30
E Grade E. F.	7.05
No. 2 Uncoated Offset 4 sides. White Coated White (Trimmed 4 sides)	8.45
No. 1 Glossy	11.90
No. 2 Glossy	10.85
No. 3 Glossy	10.15
No. 4 Glossy	9.80
No. 5 Glossy	9.30
C2S Offset	10.40
C1S Litho (Varnish)	10.00
C1S Litho (Non-Varnish)	9.80

Writing Papers—OPA base maximum prices per cwt. on writing papers, f. o. b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—	per cwt. 20 lb.	16 lb.
Extra 100% Rag	34.00	34.00
100% Rag	28.00	28.00
75% Rag	20.00	20.00
50% Rag	16.00	17.25
25% Rag	14.00	15.00

Rag Content Ledger—	per cwt. Zone 1
Extra 100% Rag	35.00
100% Rag	29.00
85% Rag	26.0
75% Rag	21
50% Rag	1
25% Rag	1

Sulphite Bond—	per cwt. 20 lb.	16 lb.
Air dry, watermarked	12.75	13.70
No. 1 (M. F.) watermarked	9.00	9.70
No. 2 (M. F.) watermarked	8.25	8.85
Plain (M. F.) unwatermarked	7.60	8.20

Sulphite Ledger—	per cwt. Zone 1
No. 1 (M. F.) watermarked	10.00
No. 2 (M. F.) watermarked	9.25
Plain (M. F.) unwatermarked	8.60

Glassine (f. o. b. mill)—	per cwt.
Embossed (25 lb. up)	13.75 to 14.5
Bleached (25 lb. up)	12.75 to 13.5
Unbleach. (25 lb. up)	11.50 to 12
Greaseproof—	
Bleach. (25 lb. up)	11.00 to 11.5
Unbleach. (25 lb. up)	10.00 to 10.5

News—OPA Ceilings—	per ton
Rolls, Standard (Contract)	61.00
Rolls, Lightweight (Cont.)	65.00
Roll (Spot)	(Nominal)
Sheets	69.00

Tissues (Carlots)—	per ream
White, No. 1	1.13¼ to 1.20
White No. 2	.90 to 1.00
Bleached Anti-Tarnish	1.15 to 1.20
Colored	—
Anti-Tarnish Kraft	.70-
Manila	.90 to .95
Napkins, semi-crepe (12¼ lb. to M shts.) per cs.	.60-
Napkins, full crepe and emb'sed (12¼ lb. to M shts.) per cs.	.60-
Toilet, Bleached (M shts.) per cs.	5.65-
Toilet, Unbleached (M shts.) per cs.	4.25-

Towels—	per cwt.
Bleached	3.20 to 3.75
Unbleached	2.60 to 3.05

Wrappings (Kraft)—	per cwt.
Super-Standard	5.25 to 7.65
No. 1 Wrapping	5.00 to 7.40
Standard Wrapping	4.75 to 7.15
Standard Bag	4.37½

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(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers— Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 40 lb.	5.50 to 5.75

Manilas—	
Envp. Mia., Sub. 16-40 (No. 1)	6.00 to 6.50
Envp. Mia., Sub. 16-28 (No. 2)	5.75 to 6.00
Envp. Mia. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mia. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M.G. Sulphite and Kraft (other than Waxing)	
Grade A-22 lb.	7.20 to 7.40
Grade B-20 lb.	6.75 to 7.00

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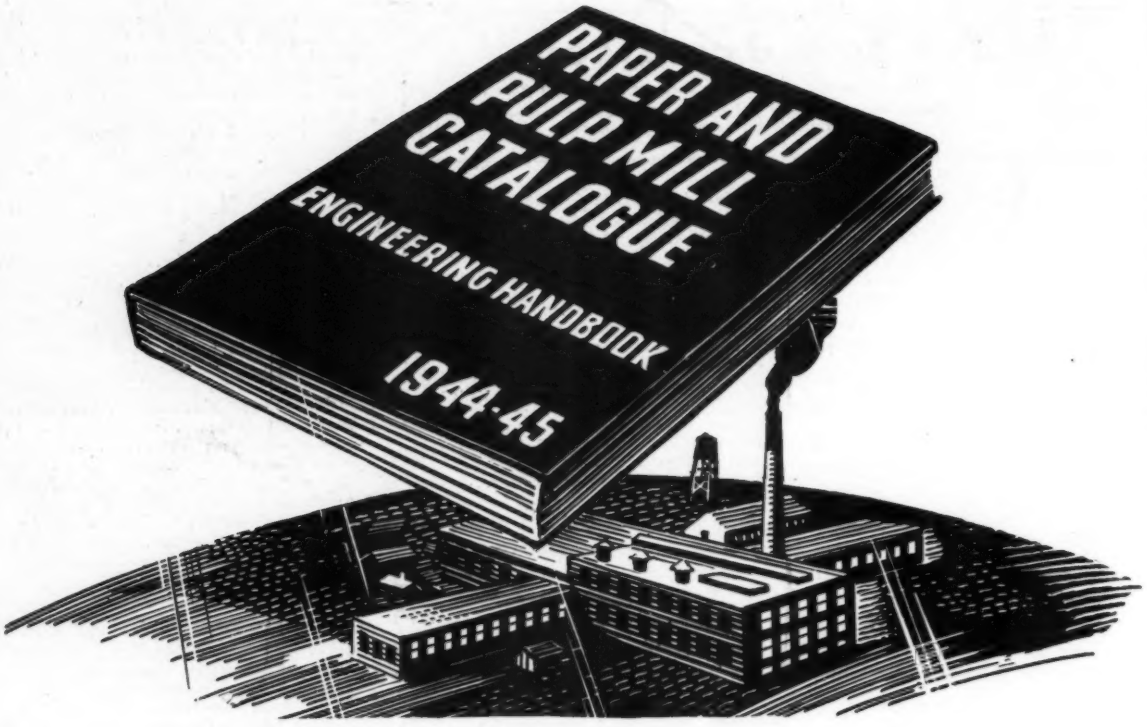

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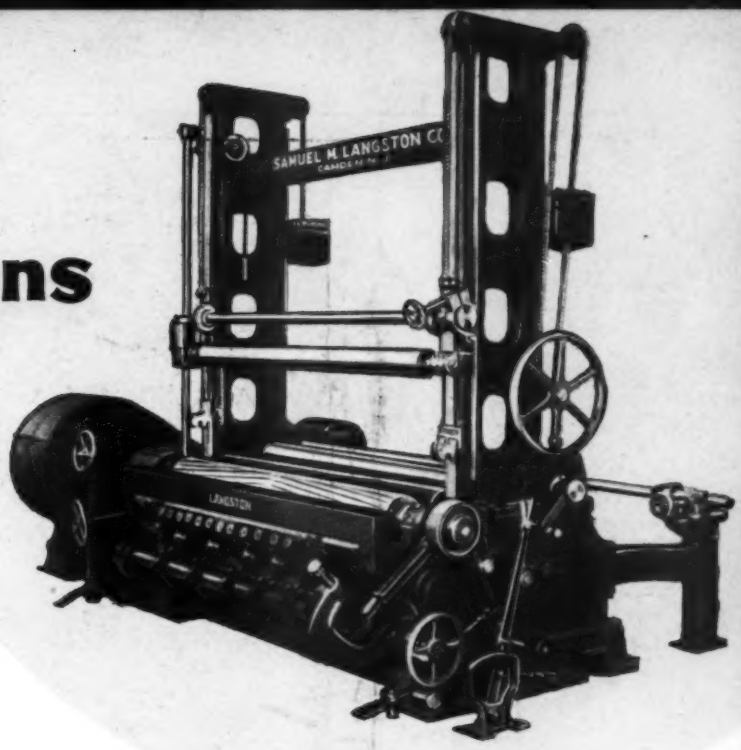

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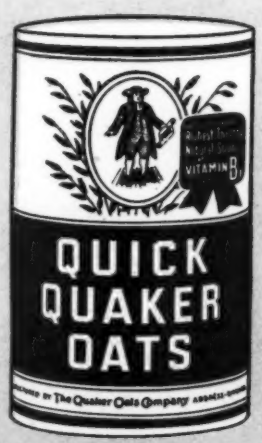

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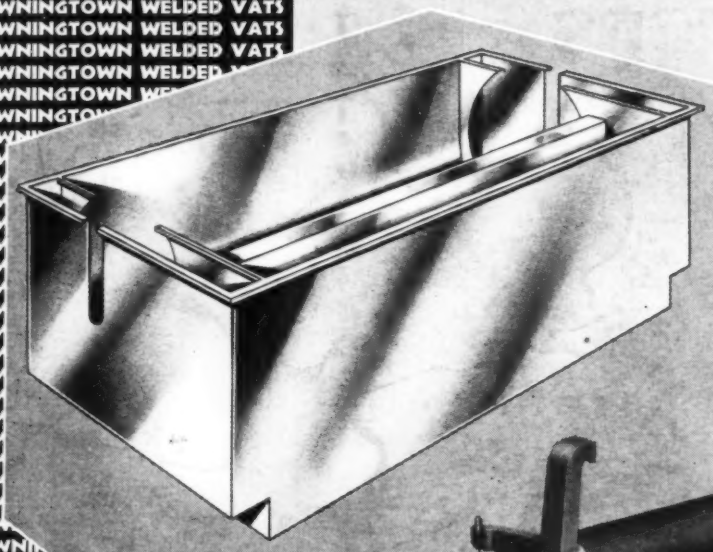

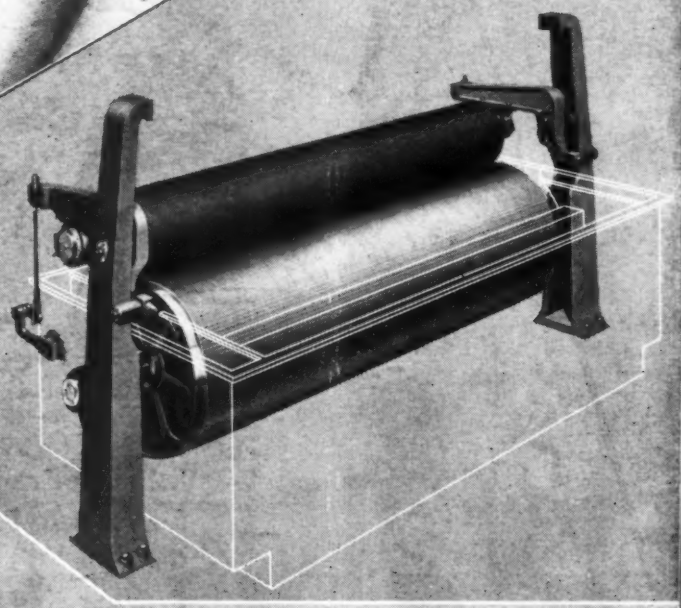

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